SBOX-2150

Fanless Box Computing

User's Manual

Version 1.0

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In-Vehicle Computing
SINTRONES

SINTRONES® Technology Corp.

User Manual

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Disclaimer

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SINTRONES® Technology Corp. makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy;however, no guarantee is given as to the correctness of the contents. For continuing product improvement, SINTRONES® Technology Corp. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

This device complies to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a SINTRONES Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.
- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.
- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.
- Place the product on a stable surface.
- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by SINTRONES® Technology Corp. Dispose used battery according to the manufacturer's instructions.

TABLE OF CONTENTS

1 Function Introduction

1.1 Model Specifications....6

1.2 SBOX-2150 Illustration <Mainboard, System> 7

1.3 Architecture 9

1.4 Principal Component Specification <CPU, South Bridge>....10

1.5 Memory Module Installation 11

1.6 Internal Connector Specification 12

■ VGA Connector 12

■ USB Connector 13

■ GPIO Connector 15

■ UART and GPIO Connector....16

■ LED Connector 17

■ COM Connector 18

■ Audio Connector 22

■ SATA Connector....23

■ Mini PCI-E Connector 25

■ Power Input Connector 27

■ SATA Power Connector....28

1.7 External Connector Specification 30

■ USB Connector 30

■ LAN Connector 31

■ DVI-I Connector 33

■ COM Connector 34

2 System Installation

2.1 System Introduction 35

2.2 Opening Chassis....36

2.3 Installing Memory 37

2.4 Installing HDD/SSD 38

2.5 Installing MINI PCI Express Expansion Card....39

2.6 Installing MINI PCI Express Expansion Card....40

TABLE OF CONTENTS

3 BIOS
3.1 Entering The BIOS 41
3.2 Main.....43
3.3 Advanced 44
3.4 Boot.....50
3.5 Security 51
3.6 Chipset 52
3.7 Exit 54
4 Packing List
4.1 Packing List 55

1 Function Introduction

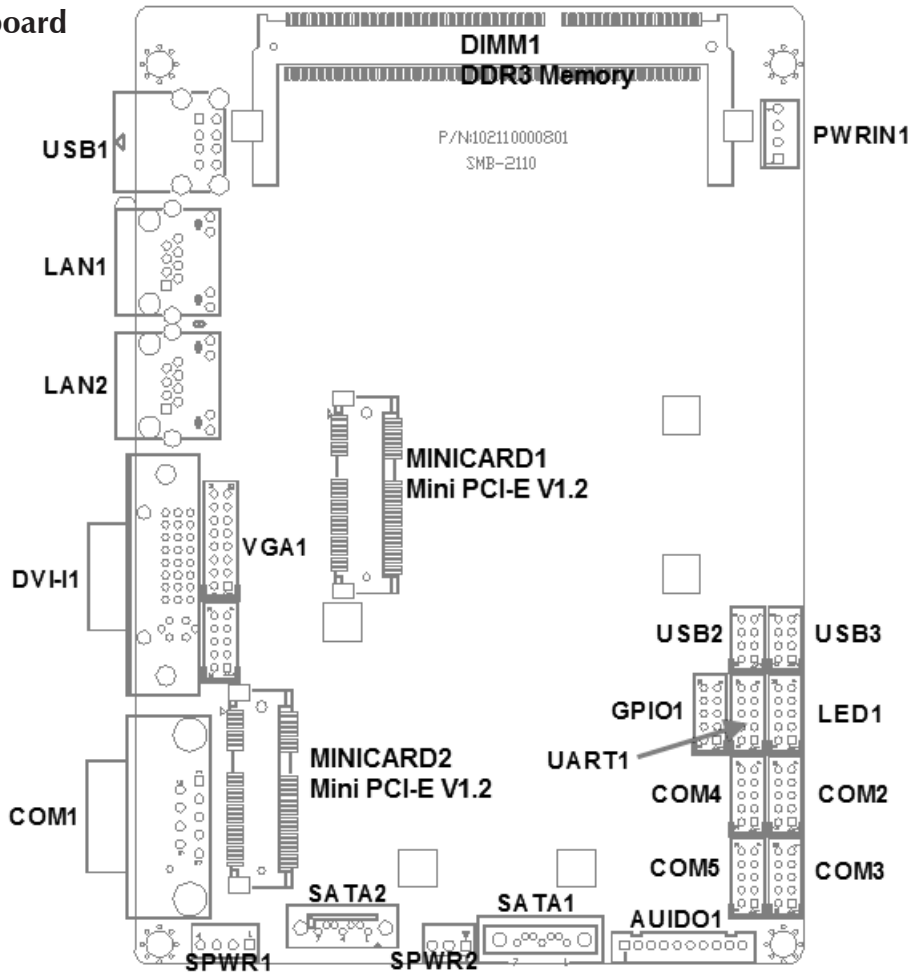
■ 1.1 Model Specifications

CPU	• Intel Cedarview Atom D2550 Dual Core 1.86GHz
Chipset	• Intel NM10
Memory	• 1 x DDRIII-1066 SO-DIMM Up to 4GB
Display	• Intel GMA3650
ATA	• 1 x Serial ATA port with 150MB/s HDD transfer rate
LAN Chipset	• 2 x Realtek 8111E Gigabit Ethernet
Watchdog	• 1 ~ 255 level reset
Serial Port	• Support 3 x RS-232 ports and 1 x RS232/422/485
USB Port	• 4 x USB 2.0 ports
LAN	• 2 x RJ45 ports for GbE
Video Port	• 1 x DVI-I female connector for DVI-D and VGA Output
GPIO Port	• Support 4 in and 4 out GPIO ports (share with 1 x RS232)
Audio	• Line-out / Mic-in (Optional)
Expansion Bus	• 2 x Mini-card slot
Storage	• 1 x 2.5" drive bay for SATA Type Hard Disk Drive / SSD
	• 1 x SATA DOM

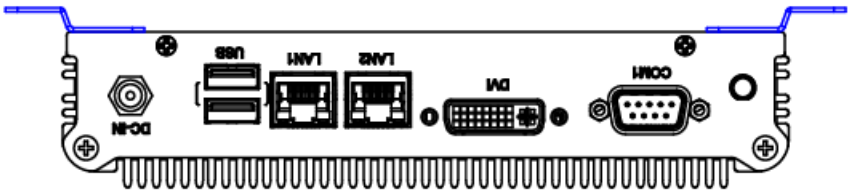
Operating Temp.	• -20 ~ -60°C, ambient w/ air
Storage Temp.	• -40 ~ 85°C
Relative Humidity	• 10 ~ 95% @ 40°C (non-condensing)
Power Input	• DC 12V Input
Construction	• Aluminum alloy
Mounting	• Supports both of wall-mount/VESA-mount
Weight	• 1200g (barebone)
Dimensions	• 182 x 167.6 x 40mm

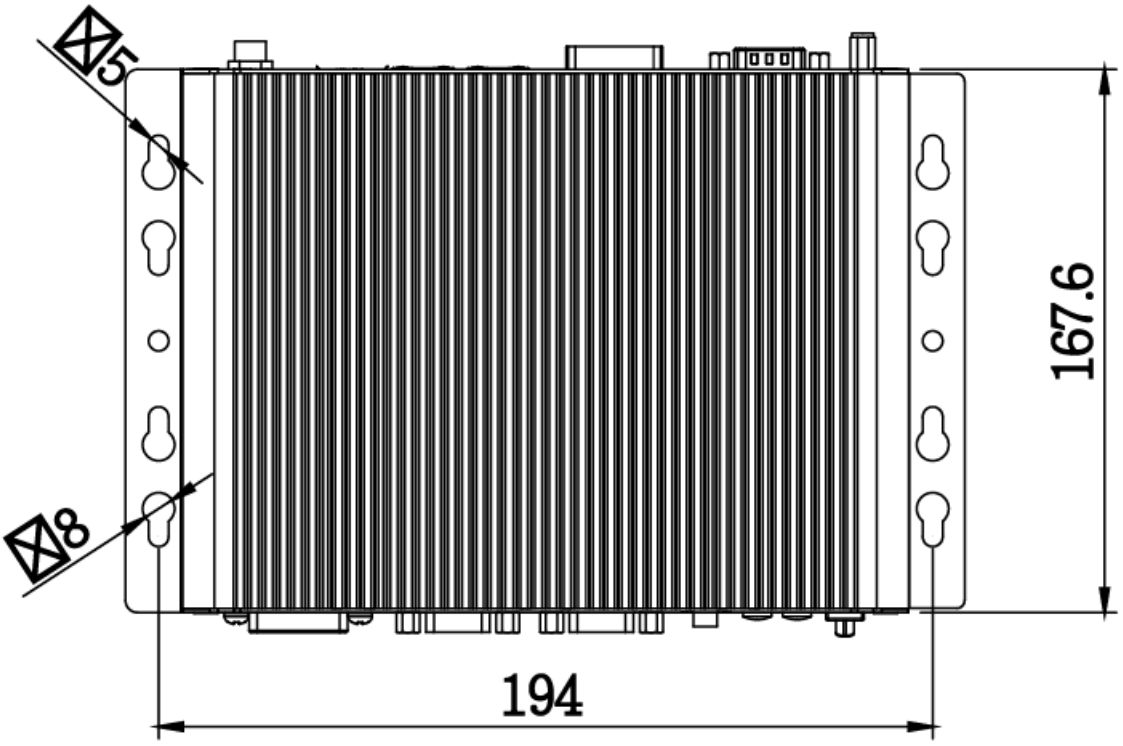
■ 1.2 SBOX-2150 Illustration

☞ **Mainboard**



☞ System


DC-IN
USB
LAN1
LAN2
DVI
COM1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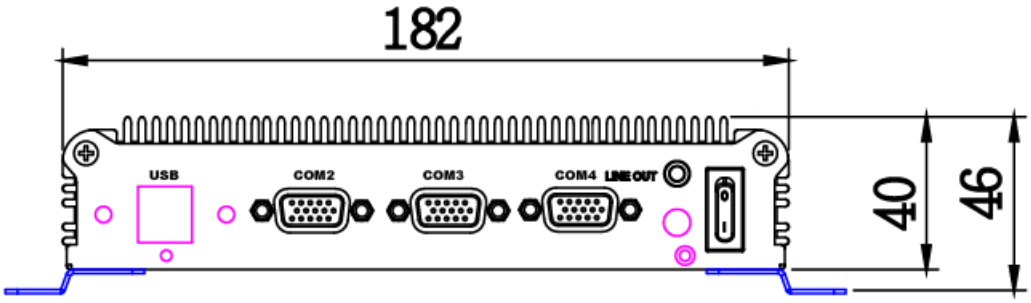
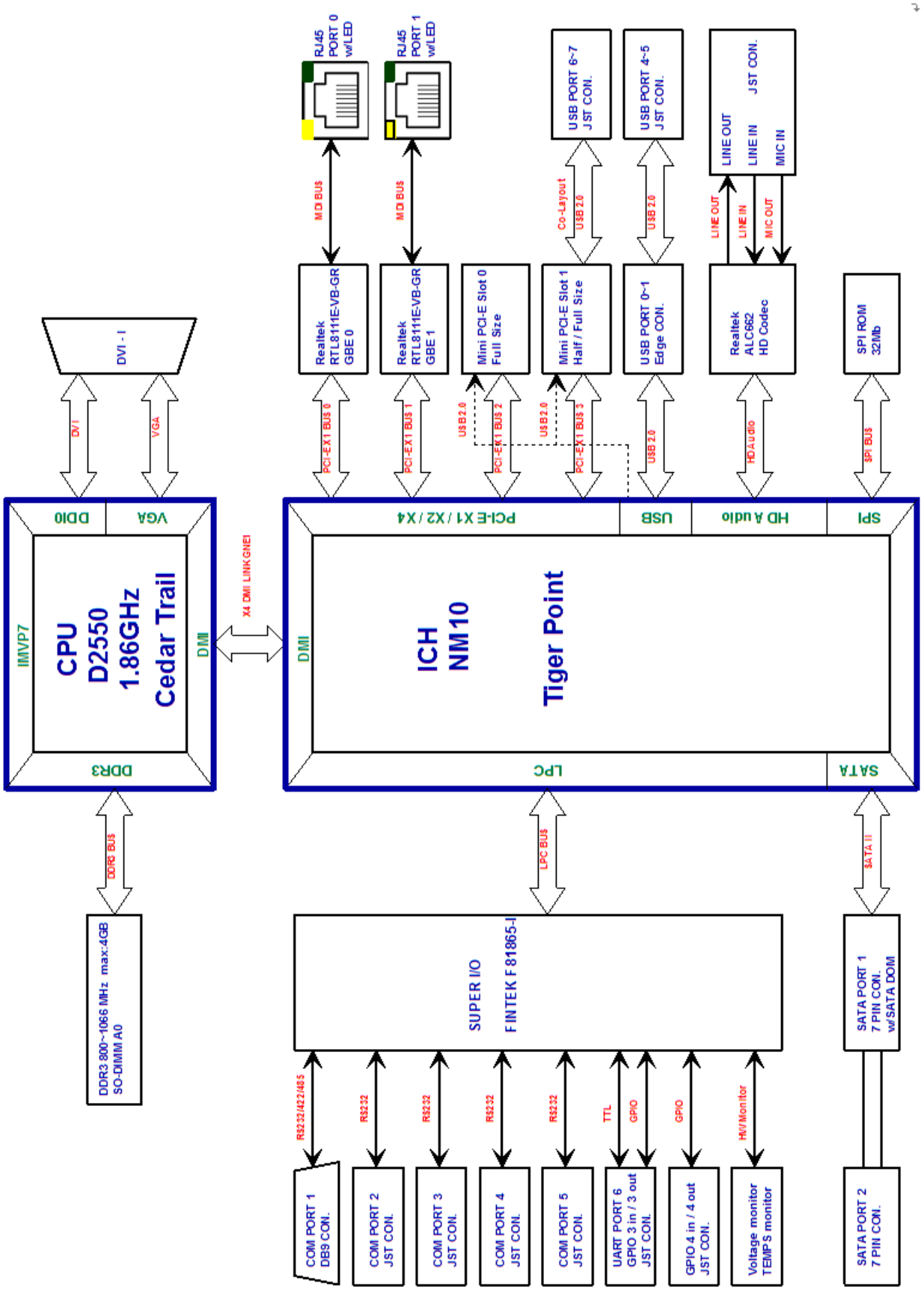
8
167.6
194


182
USB
COM2
COM3
COM4
LINE OUT
40
46

■ 1.3 Architecture



■ 1.4 Principal Component Specification

CPU

<table>
<tr><td>Chip</td><td>Description</td></tr>
<tr><td>Intel</td><td>1. Power consumption:
<table>
<tr><th>Symbol</th><th>Processor Number</th><th>Core Frequency/ GHz</th><th>Thermal Design Power</th><th>Unit</th><th>Tj min (°C)</th><th>Tj max (°C)</th><th>Notes</th></tr>
<tr><td>TDP</td><td>N2600
N2800
D2500
D2700</td><td>1.86 - 1.6
2.13 - 1.86
2.13 - 1.86
2.4 - 2.13</td><td><=3.5
<=6.5
<=10
<=10</td><td>W
W
W
W</td><td>0</td><td>100
100
100
100</td><td></td></tr>
<tr><th>Symbol</th><th colspan="3">Parameter</th><th>Max</th><th>Unit</th><th></th><th></th><th></th></tr>
<tr><td>$P_{AVERAGE}$</td><td>N2600
N2800</td><td colspan="3"></td><td>~1.25
~1.7</td><td>W
W</td><td>0</td><td>50</td><td></td></tr>
<tr><td>P_{IDLE}</td><td>D2500
D2700</td><td colspan="3"></td><td>TBD
~2.7</td><td>W
W</td><td>0</td><td>50</td><td></td></tr>
</table>
</td></tr>
</table>

South Bridge

Chip	Description
Intel NM10	1. Power consumption: 2.1W

■ 1.5 Memory Module Installation

The SBOX-2150 provide one 204pins SODIMM slot for DDR3 1066MHz SDRAM memory modules and supports memory sizes up to 4GB.

These DIMM slots are inteded for memory modules.

DDR3 SO-DIMM Slot
204-pin, 1.5V

Installing Memory Module

1. Locate the DIMM1 SO-DIMM slot. Align the notch on the DIMM with the key on the slot and insert the DIMM into the slot at 45-degree angle.
2. Push the DIMM gently forwards until the slot levers click and lock the DIMM in place. Follow the same procedures to install the second DIMM if necessary.
3. To uninstall the DIMM, flip the slot levers outwards and the DIMM will be released instantly.

Important

You can barely see the golden finger if the DIMM is properly inserted in the DIMM slot.

■ 1.6 Internal connector specification

<table>
<tr><th colspan="2">VGA connector</th></tr>
<tr><td>Connector size</td><td>2 X 8 = 16 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>VGA1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>RED</td><td>2</td><td>GREEN</td></tr>
<tr><td>3</td><td>BLUE</td><td>4</td><td>NC</td></tr>
<tr><td>5</td><td>CER_DET</td><td>6</td><td>GND</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
<tr><td>9</td><td>+5V</td><td>10</td><td>GND</td></tr>
<tr><td>11</td><td>NC</td><td>12</td><td>DAC_SDA</td></tr>
<tr><td>13</td><td>HSYNC</td><td>14</td><td>VSYNC</td></tr>
<tr><td>15</td><td>DAC_SCL</td><td>16</td><td>NC</td></tr>
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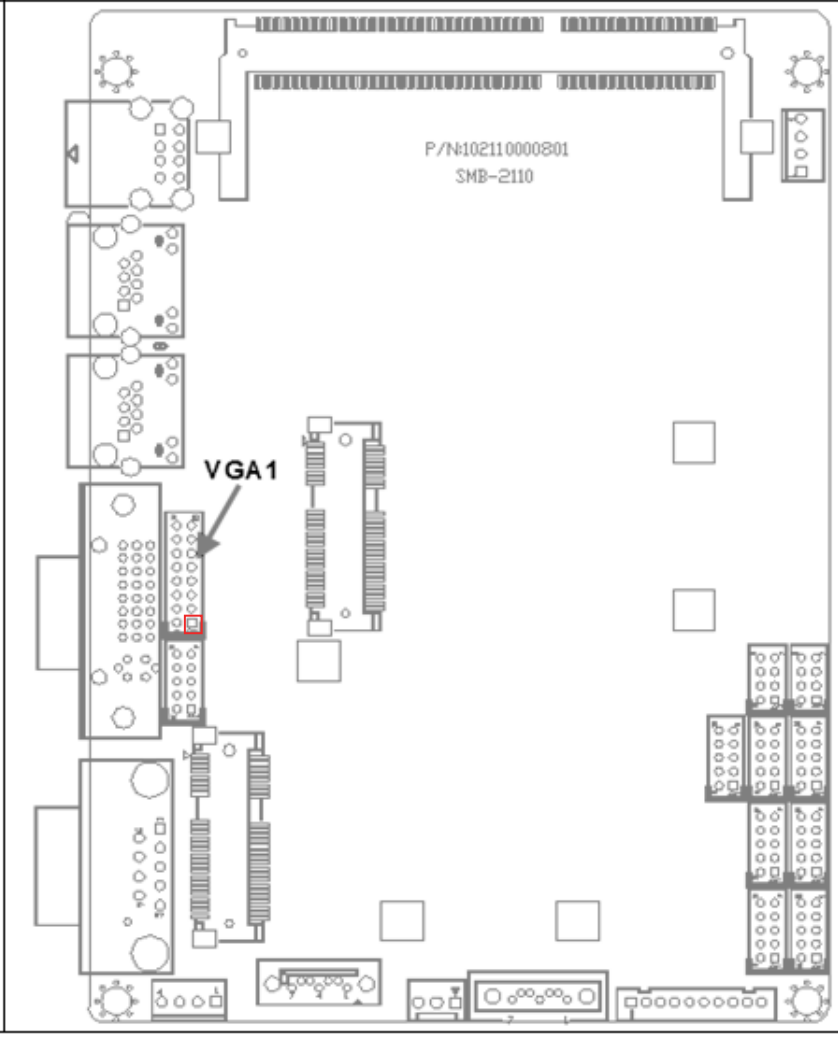
<tr><td>Connector map</td><td> 
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<table>
<tr><th colspan="2">USB connector</th></tr>
<tr><td>Connector size</td><td>2 X 4 = 8 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>USB2</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>5VSB</td><td>2</td><td>5VSB</td></tr>
<tr><td>3</td><td>USB1_N</td><td>4</td><td>USB2_N</td></tr>
<tr><td>5</td><td>USB1_P</td><td>6</td><td>USB2_P</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
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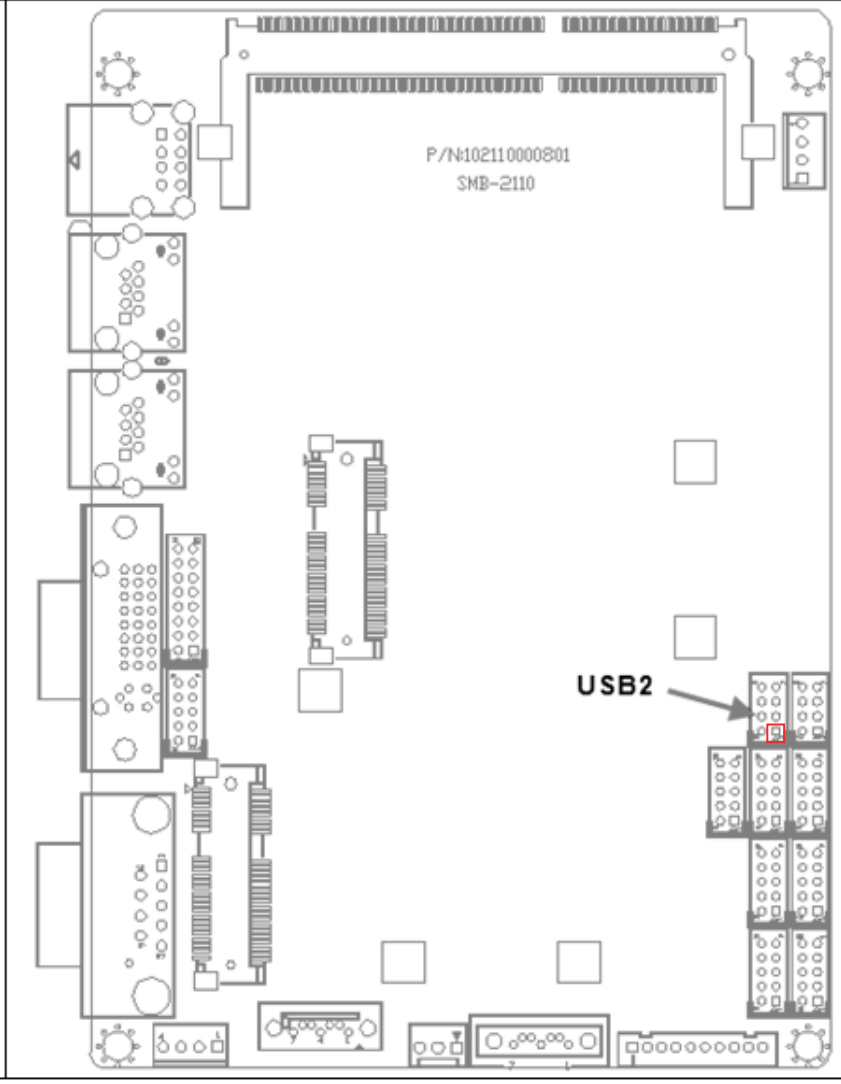
<tr><td>Connector map</td><td> 
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<table>
<tr><th colspan="2">USB connector</th></tr>
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<tr><td>Connector location</td><td>USB3</td></tr>
<tr><td>Connector pin definition</td><td>
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<tr><td>3</td><td>USB4_N</td><td>4</td><td>NC/ USB6_N</td></tr>
<tr><td>5</td><td>USB4_P</td><td>6</td><td>NC/ USB6_P</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
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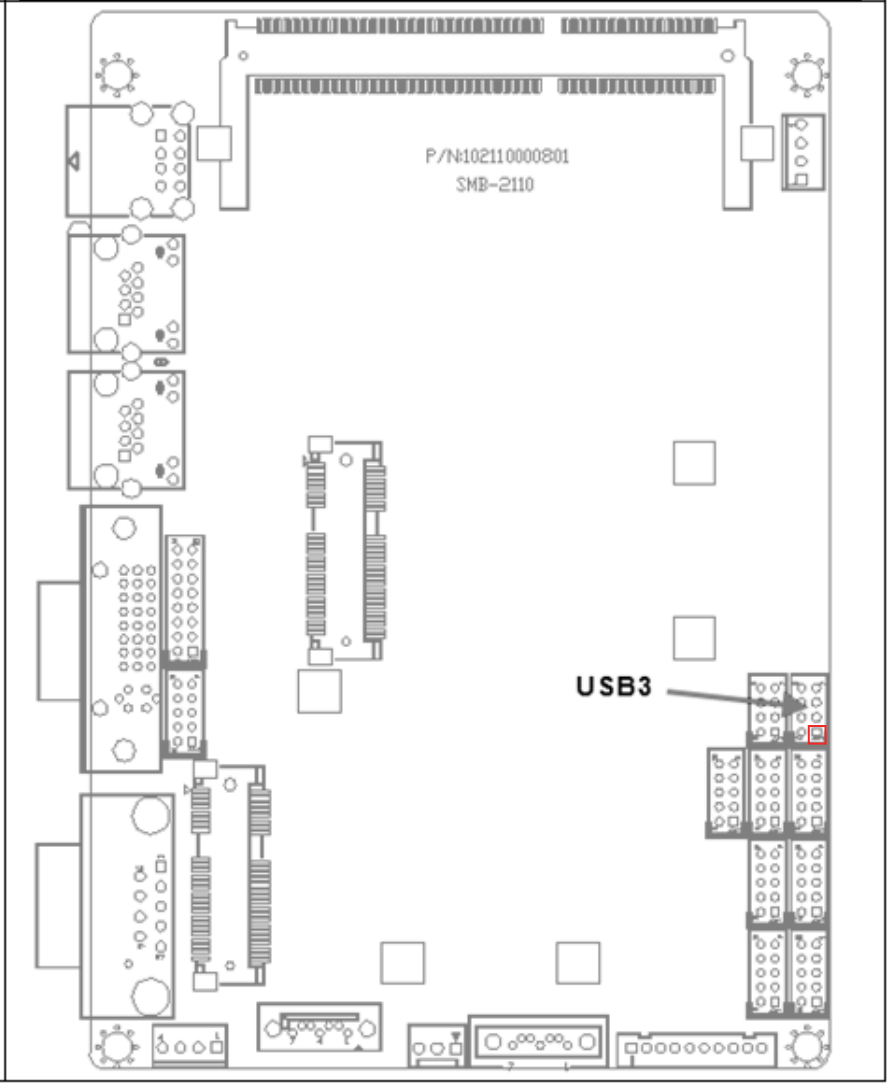
<tr><td>Connector map</td><td> 
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<tr><th colspan="2">GPIO connector</th></tr>
<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
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<tr><td>Connector location</td><td>GPIO1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>GND</td><td>2</td><td>+5V</td></tr>
<tr><td>3</td><td>GPI0</td><td>4</td><td>GPO0</td></tr>
<tr><td>5</td><td>GPI1</td><td>6</td><td>GPO1</td></tr>
<tr><td>7</td><td>GPI2</td><td>8</td><td>GPO2</td></tr>
<tr><td>9</td><td>GPI3</td><td>10</td><td>GPO3</td></tr>
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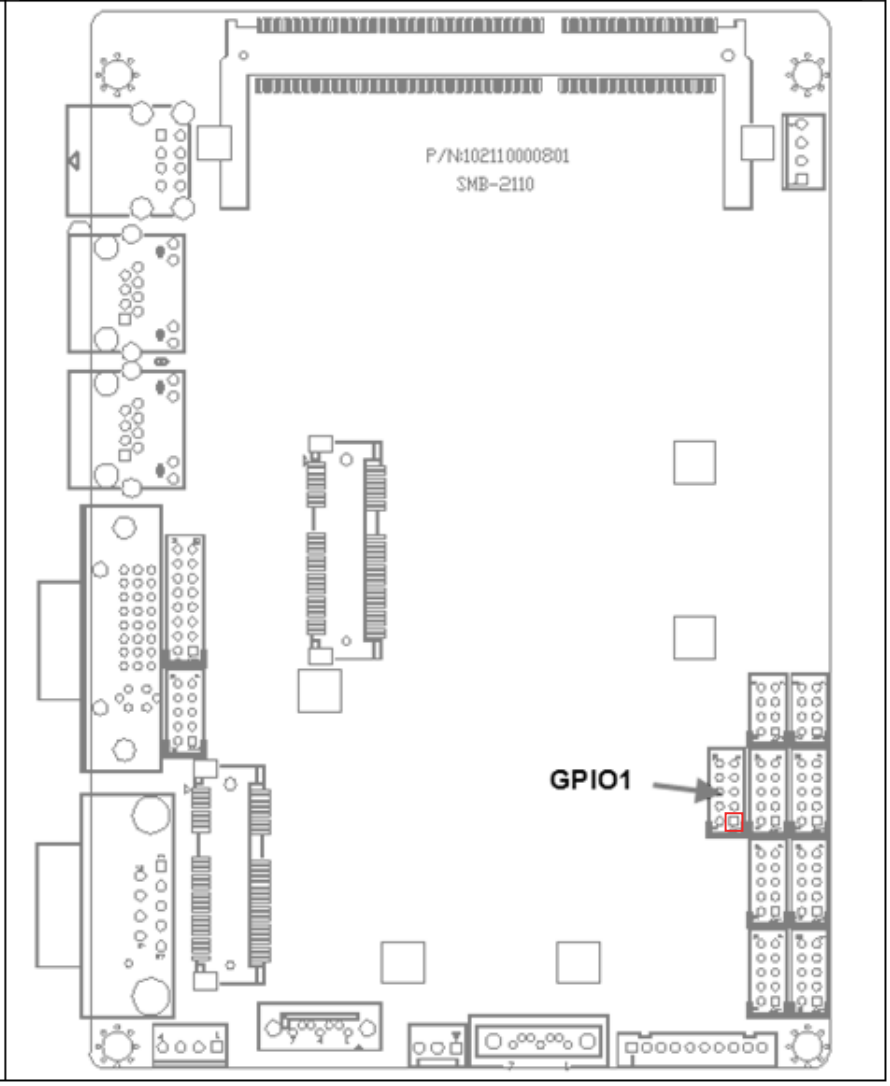
<tr><td>Connector map</td><td> 
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<tr><th colspan="2">UART and GPIO connector</th></tr>
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<tr><td>Connector pin definition</td><td>
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<tr><td>1</td><td>GPIO0</td><td>2</td><td>COM6_RX</td></tr>
<tr><td>3</td><td>COM6_TX</td><td>4</td><td>GPIO4</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>GPIO3</td></tr>
<tr><td>7</td><td>GPIO1</td><td>8</td><td>GND</td></tr>
<tr><td>9</td><td>GPIO2</td><td>10</td><td>+5V</td></tr>
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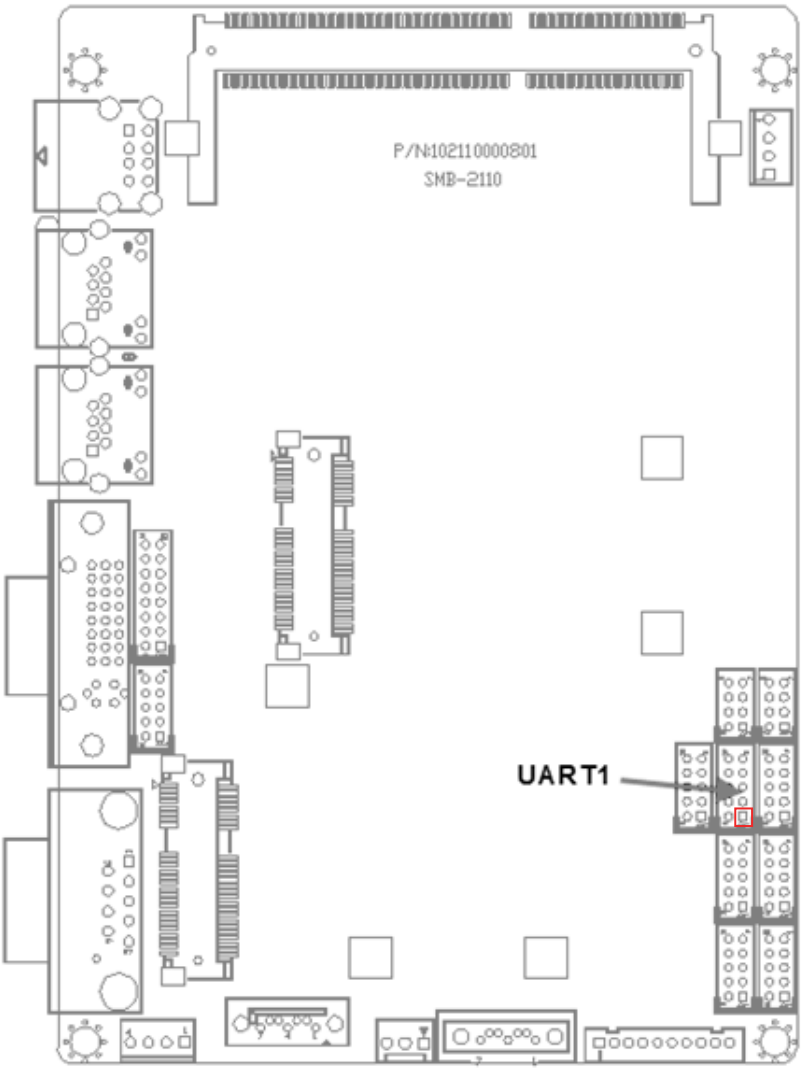
<tr><td>Connector map</td><td> 
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<tr><td>Connector location</td><td>LED1</td></tr>
<tr><td>Connector pin definition</td><td>
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<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>HDD_LED_N</td><td>2</td><td>HDD_LED_P</td></tr>
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<tr><td>5</td><td>GND</td><td>6</td><td>PWRBT#</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>HW_RESET#</td></tr>
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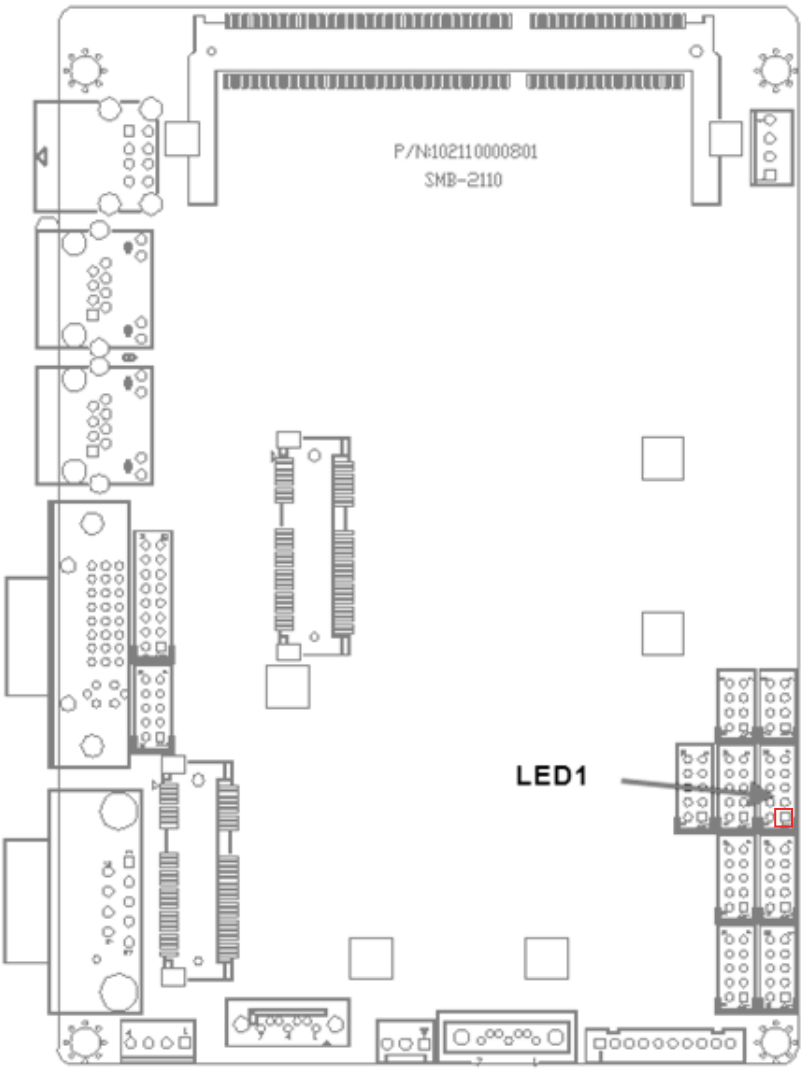
<tr><td>Connector map</td><td> 
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<tr><td>Connector location</td><td>COM2</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
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<tr><td>3</td><td>COM2_TXD</td><td>4</td><td>COM2_DTR</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>COM2_DSR</td></tr>
<tr><td>7</td><td>COM2_RTS</td><td>8</td><td>COM2_CTS</td></tr>
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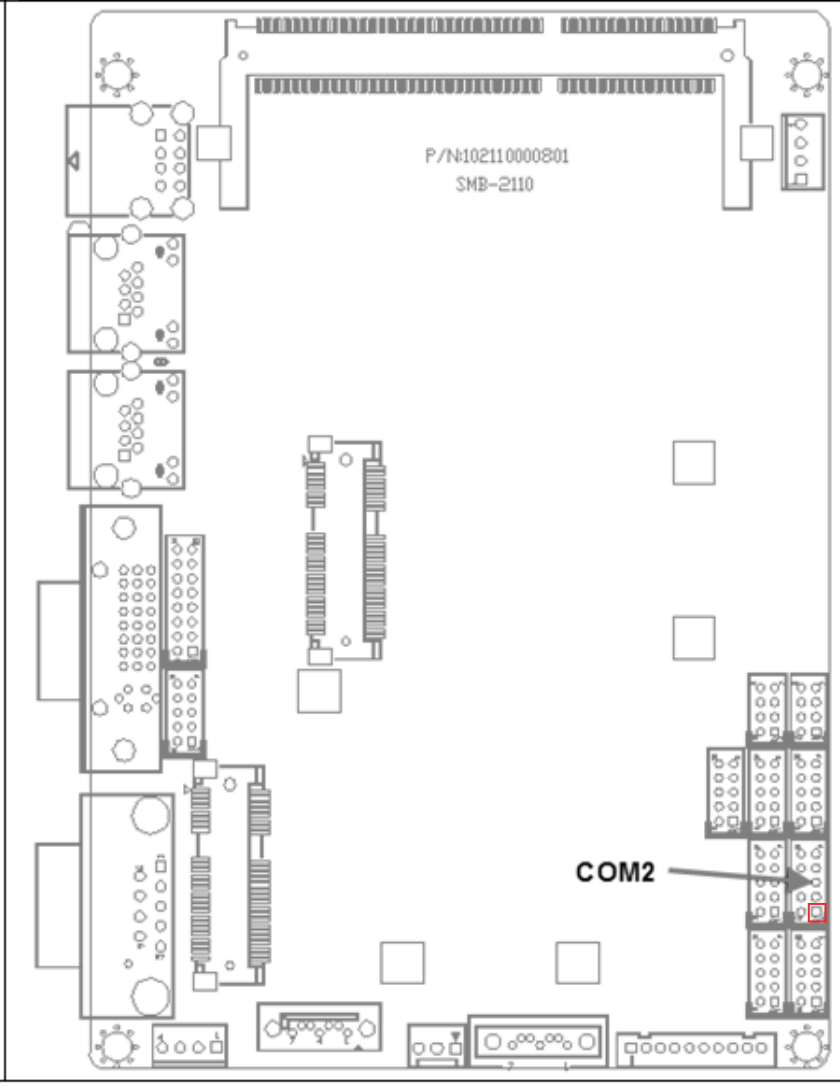
<tr><td>Connector map</td><td> 
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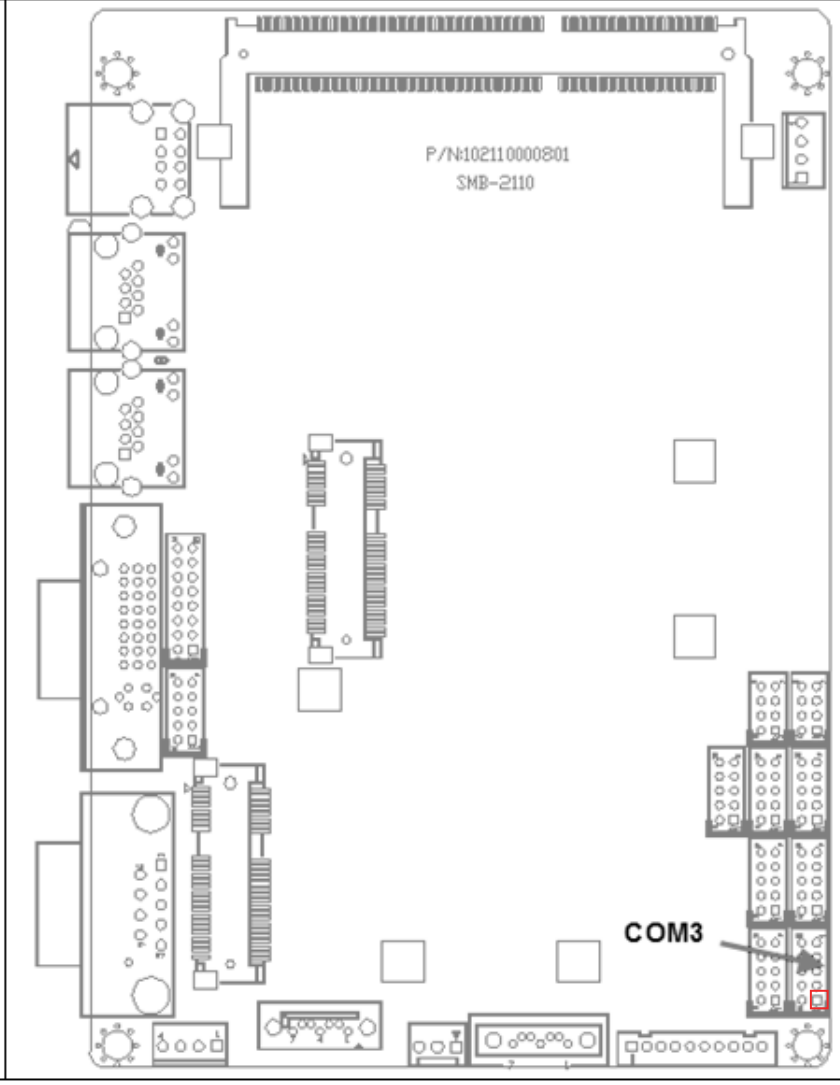
<tr><td>Connector map</td><td> 
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<tr><td>7</td><td>COM4_RTS</td><td>8</td><td>COM4_CTS</td></tr>
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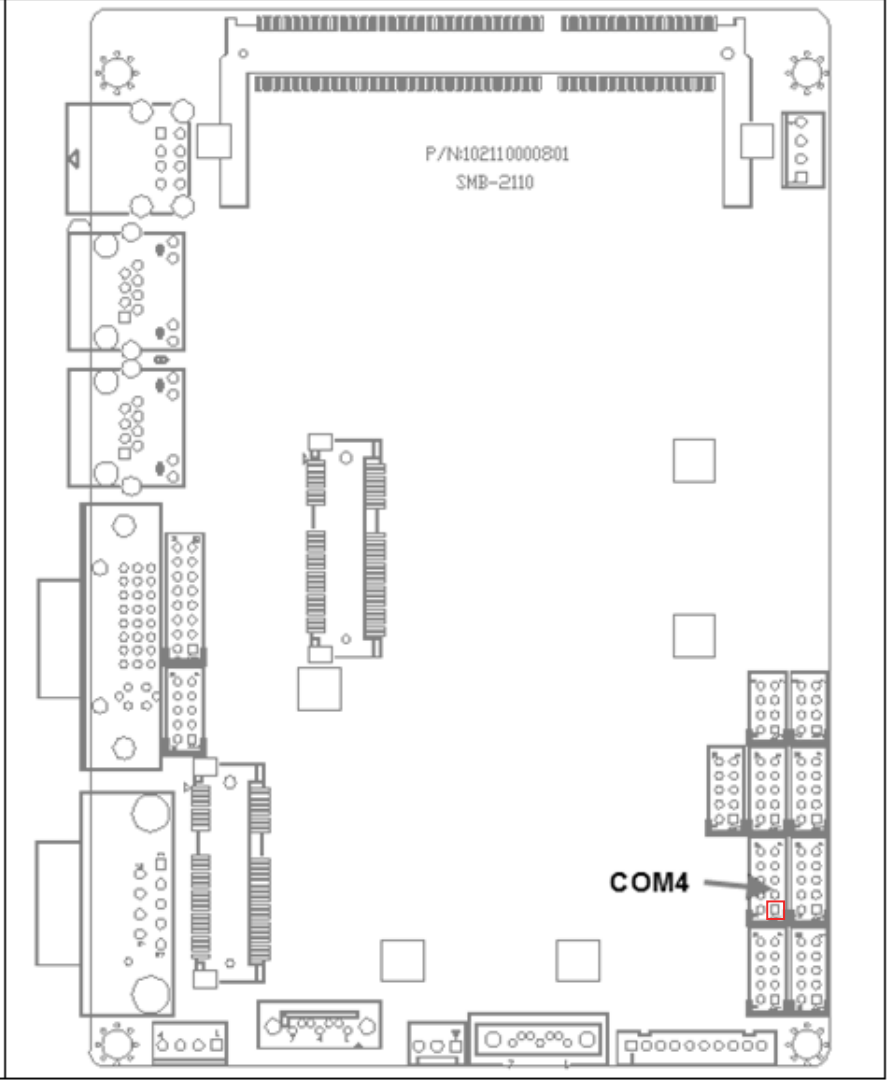
<tr><td>Connector map</td><td> 
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<tr><td>3</td><td>COM5_TXD</td><td>4</td><td>COM5_DTR</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>COM5_DSR</td></tr>
<tr><td>7</td><td>COM5_RTS</td><td>8</td><td>COM5_CTS</td></tr>
<tr><td>9</td><td>COM5_RI</td><td>10</td><td>GND</td></tr>
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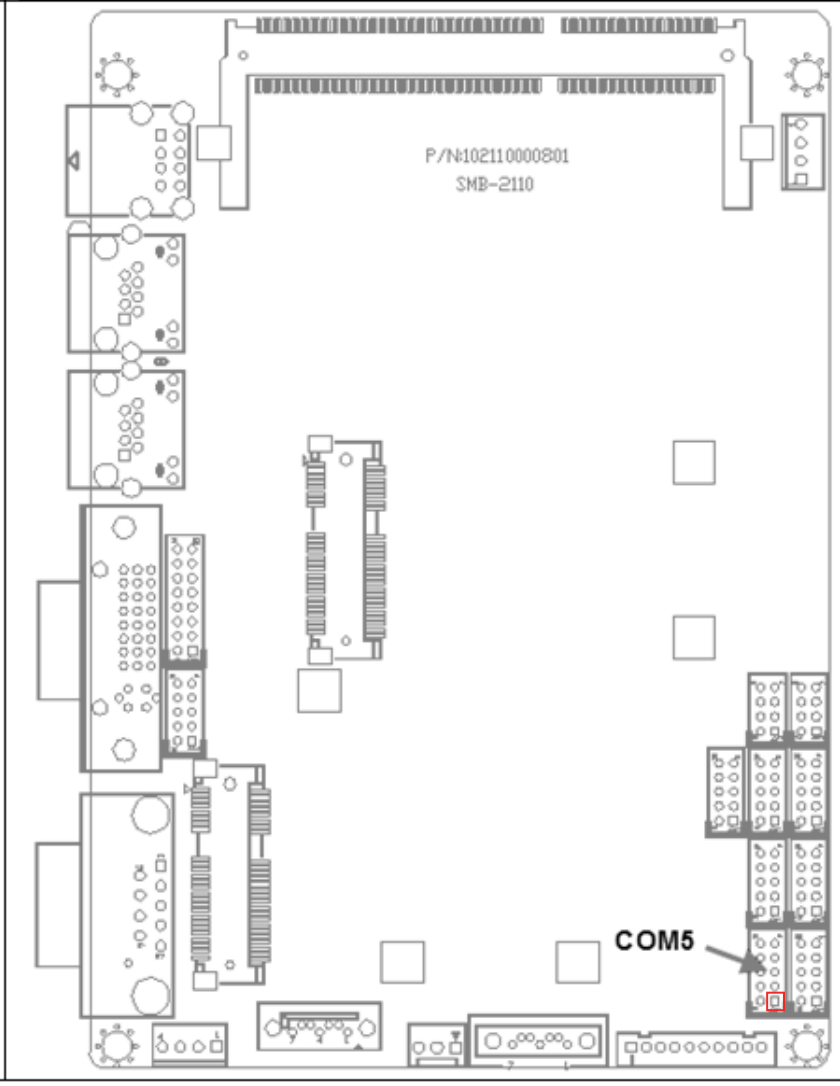
<tr><td>Connector map</td><td> 
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<table>
<tr><th colspan="2">AUDIO connector</th></tr>
<tr><td>Connector size</td><td>1 X 10 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>AUDIO1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>FRONT_OUT_L</td></tr>
<tr><td>2</td><td>FRONT_OUT_R</td></tr>
<tr><td>3</td><td>FRONT-JD</td></tr>
<tr><td>4</td><td>LINE_IN_L</td></tr>
<tr><td>5</td><td>LINE_IN _R</td></tr>
<tr><td>6</td><td>LINE-JD</td></tr>
<tr><td>7</td><td>MIC_IN_ L</td></tr>
<tr><td>8</td><td>MIC_IN_R</td></tr>
<tr><td>9</td><td>MIC-JD</td></tr>
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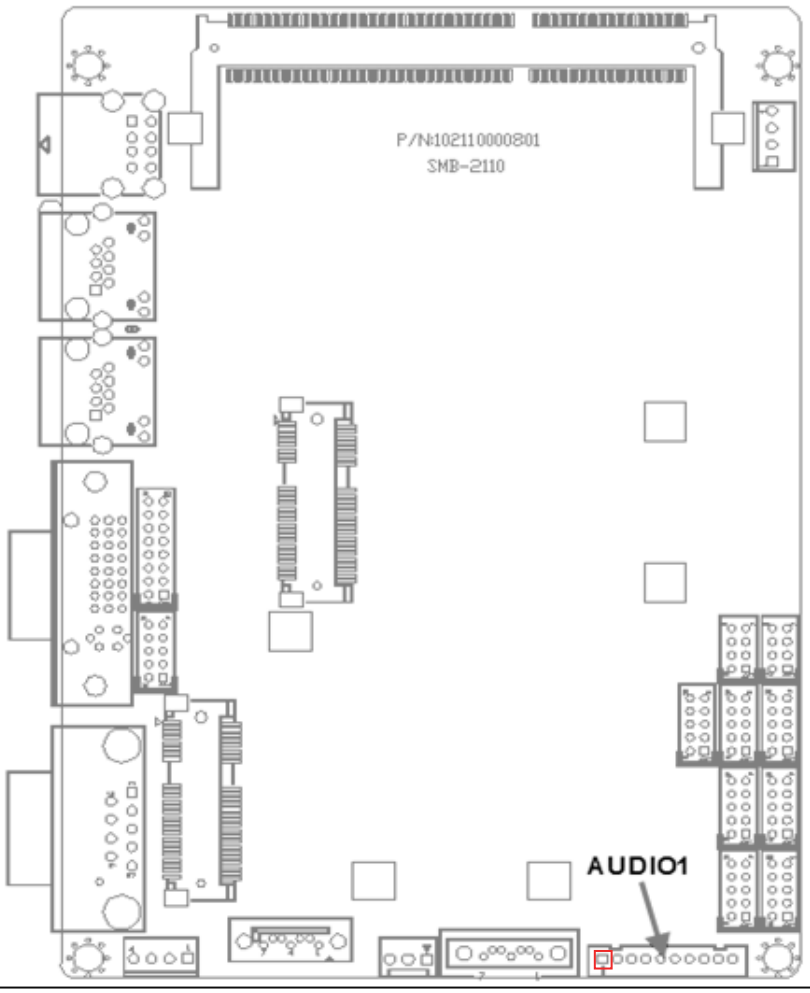
<tr><td>Connector map</td><td> 
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<table>
<tr><th colspan="2">SATA connector</th></tr>
<tr><td>Connector size</td><td>1 X 7 = 7 Pin</td></tr>
<tr><td>Connector type</td><td>SATA 1.27mm-M-180D</td></tr>
<tr><td>Connector location</td><td>SATA1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>GND</td></tr>
<tr><td>2</td><td>SATA_TXP0</td></tr>
<tr><td>3</td><td>SATA_TXN0</td></tr>
<tr><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>SATA_RXN0</td></tr>
<tr><td>6</td><td>SATA_RXP0</td></tr>
<tr><td>7</td><td>GND</td></tr>
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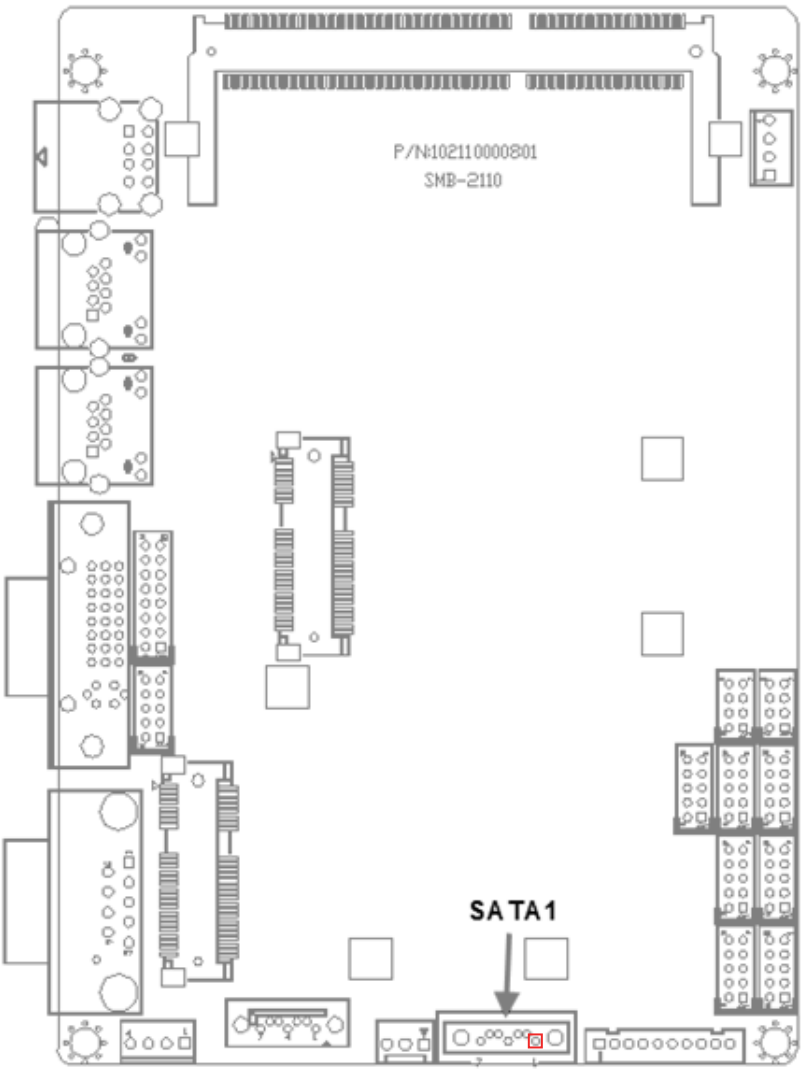
<tr><td>Connector map</td><td> 
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<tr><td>Connector location</td><td>SATA2</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
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<tr><td>2</td><td>SATA_TXP1</td></tr>
<tr><td>3</td><td>SATA_TXN1</td></tr>
<tr><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>SATA_RXN1</td></tr>
<tr><td>6</td><td>SATA_RXP1</td></tr>
<tr><td>7</td><td>GND</td></tr>
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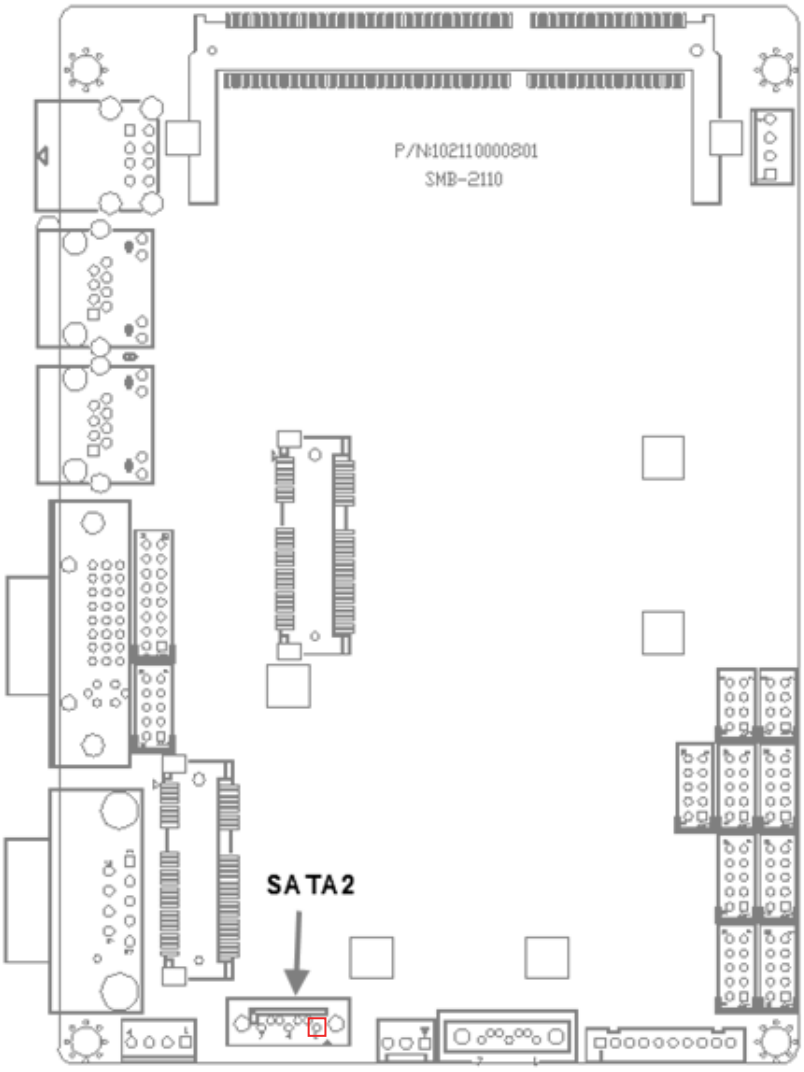
<tr><td>Connector map</td><td> 
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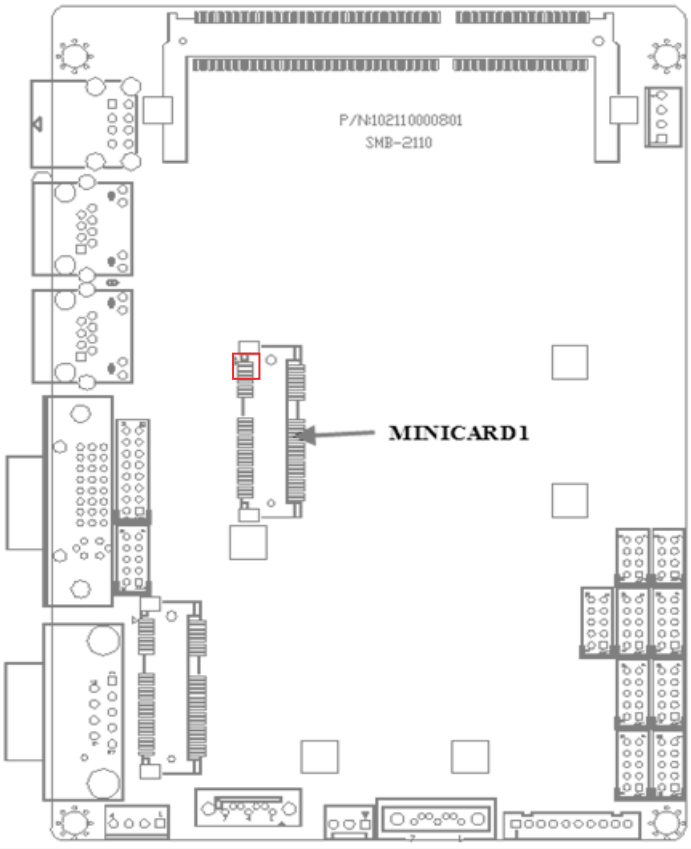
Mini PCI-E connector

Connector size	2 X 26 = 52 Pin
Connector type	MINI PCI-E CON 9.2mmH
Connector location	**MINICARD1**

Connector pin definition

Pin	Signal	Pin	Signal
1	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD0_CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_MCARD0_CLK_N	12	NC
13	PCIE_MCARD0_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD0_DIS#
21	GND	22	PCIE_RST#
23	PCIE_MCARD0_RX_N	24	3VSB
25	PCIE_MCARD0_RX_P	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_MCARD0_TX_N	32	SMB_DATA
33	PCIE_MCARD0_TX_P	34	GND
35	GND	36	USB_6N
37	GND	38	USB_6P
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

Connector map



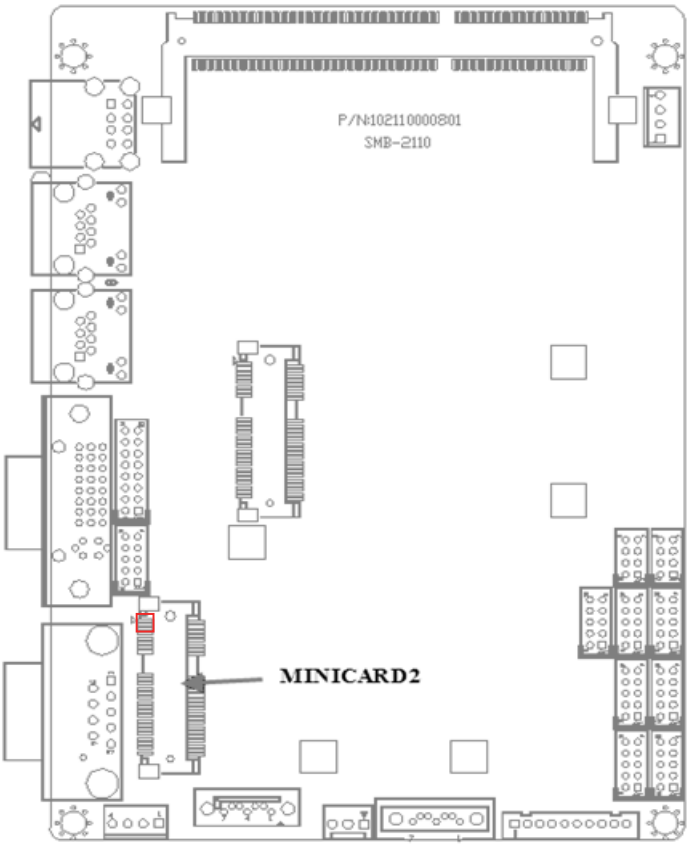
Mini PCI-E connector

Connector size	2 X 26 = 52 Pin
Connector type	MINI PCI-E CON 9.2mmH
Connector location	**MINICARD2**

Connector pin definition

Pin	Signal	Pin	Signal
1	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD1_CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_MCARD1_CLK_N	12	NC
13	PCIE_MCARD1_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD1_DIS#
21	GND	22	PCIE_RST#
23	PCIE_MCARD1_RX_N	24	3VSB
25	PCIE_MCARD1_RX_P	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_MCARD1_TX_N	32	SMB_DATA
33	PCIE_MCARD1_TX_P	34	GND
35	GND	36	USB_5N
37	GND	38	USB_5P
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

Connector map



<table>
<tr><th colspan="2">POWER Input connector</th></tr>
<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>WAFER 2.54mm-M-180</td></tr>
<tr><td>Connector location</td><td>PWRIN1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+12VSB</td></tr>
<tr><td>2</td><td>+12VSB</td></tr>
<tr><td>3</td><td>GND</td></tr>
<tr><td>4</td><td>GND</td></tr>
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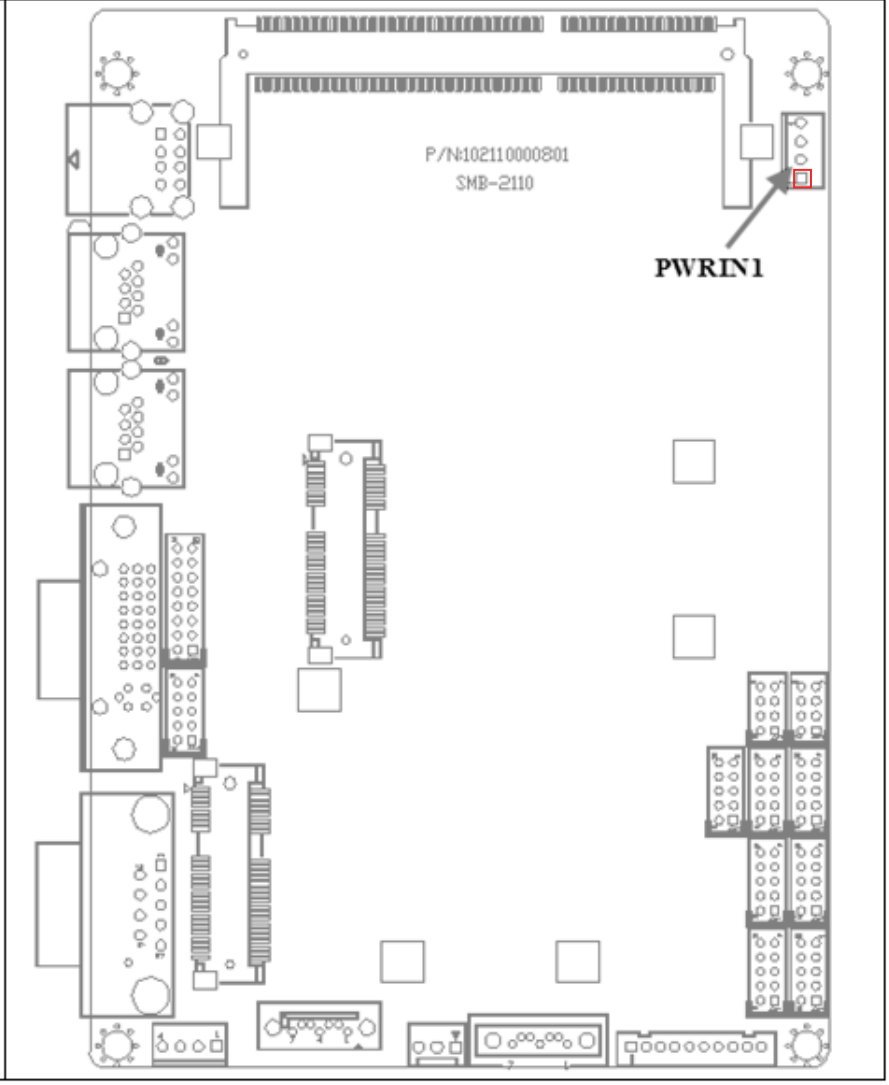
<tr><td>Connector map</td><td> 
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<tr><th colspan="2">SATA power connector</th></tr>
<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>WAFER 2.54mm-M-180</td></tr>
<tr><td>Connector location</td><td>SPWR1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5V</td></tr>
<tr><td>2</td><td>GND</td></tr>
<tr><td>3</td><td>GND</td></tr>
<tr><td>4</td><td>+12V</td></tr>
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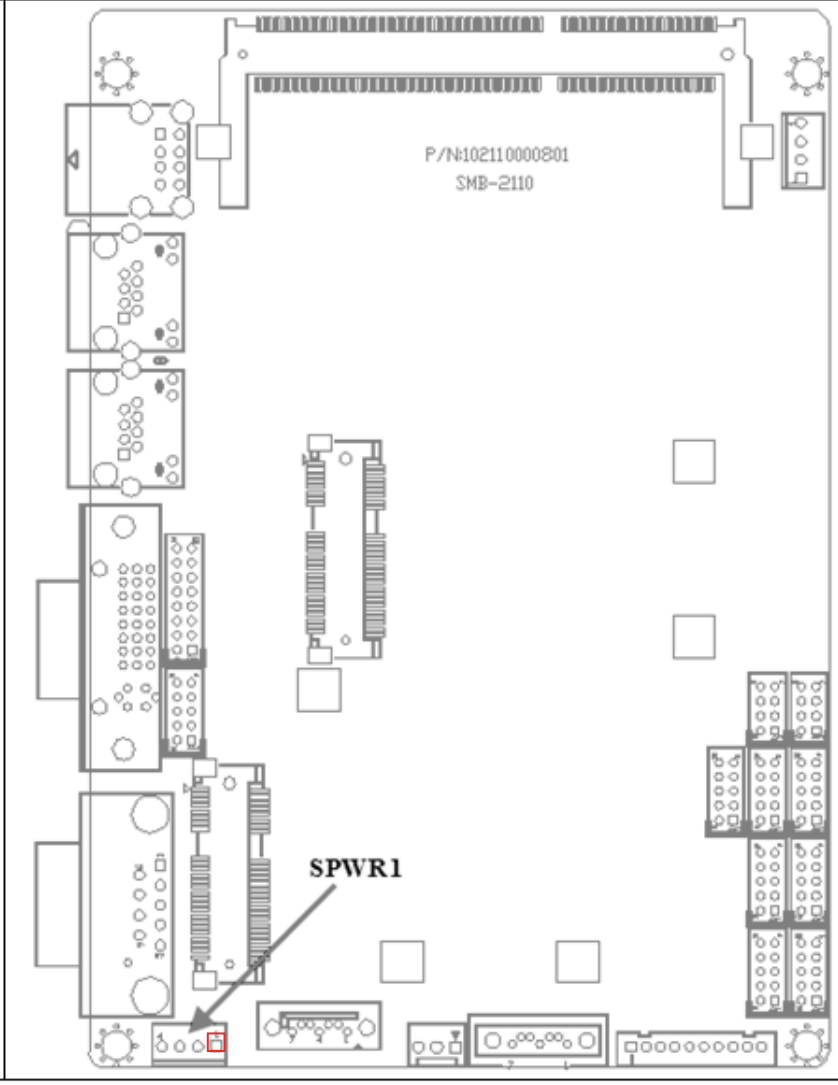
<tr><td>Connector map</td><td> 
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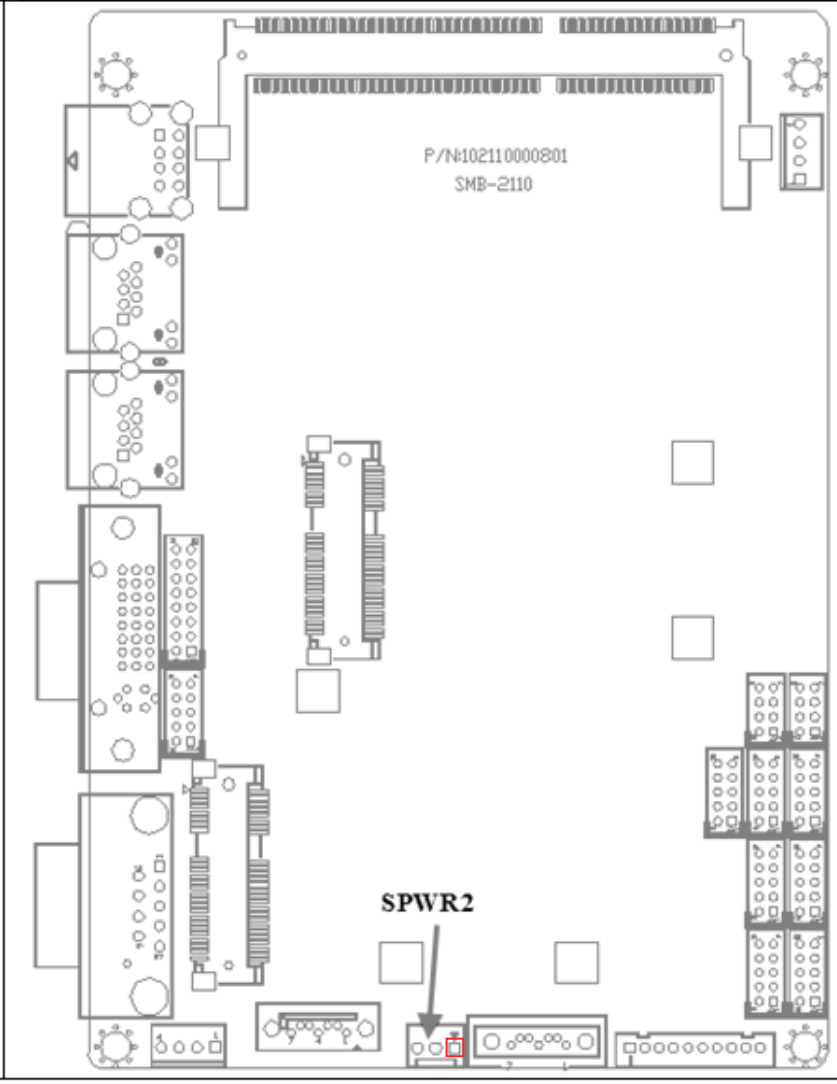
4.18 SATA power connector

Connector size	1 X 3 = 3 Pin
Connector type	WAFER 2.54mm-M-180
Connector location	**SPWR2**

Connector pin definition

Pin	Signal
1	+12V
2	+5V
3	GND

Connector map



■ 1.7 External connector specification

<table>
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<tr><td>Connector size</td><td>8 Pin</td></tr>
<tr><td>Connector type</td><td>Type A</td></tr>
<tr><td>Connector location</td><td>USB1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>5VSB</td><td>2</td><td>USB7_N</td></tr>
<tr><td>3</td><td>USB7_P</td><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>5VSB</td><td>6</td><td>USB0_N</td></tr>
<tr><td>7</td><td>USB0_P</td><td>8</td><td>GND</td></tr>
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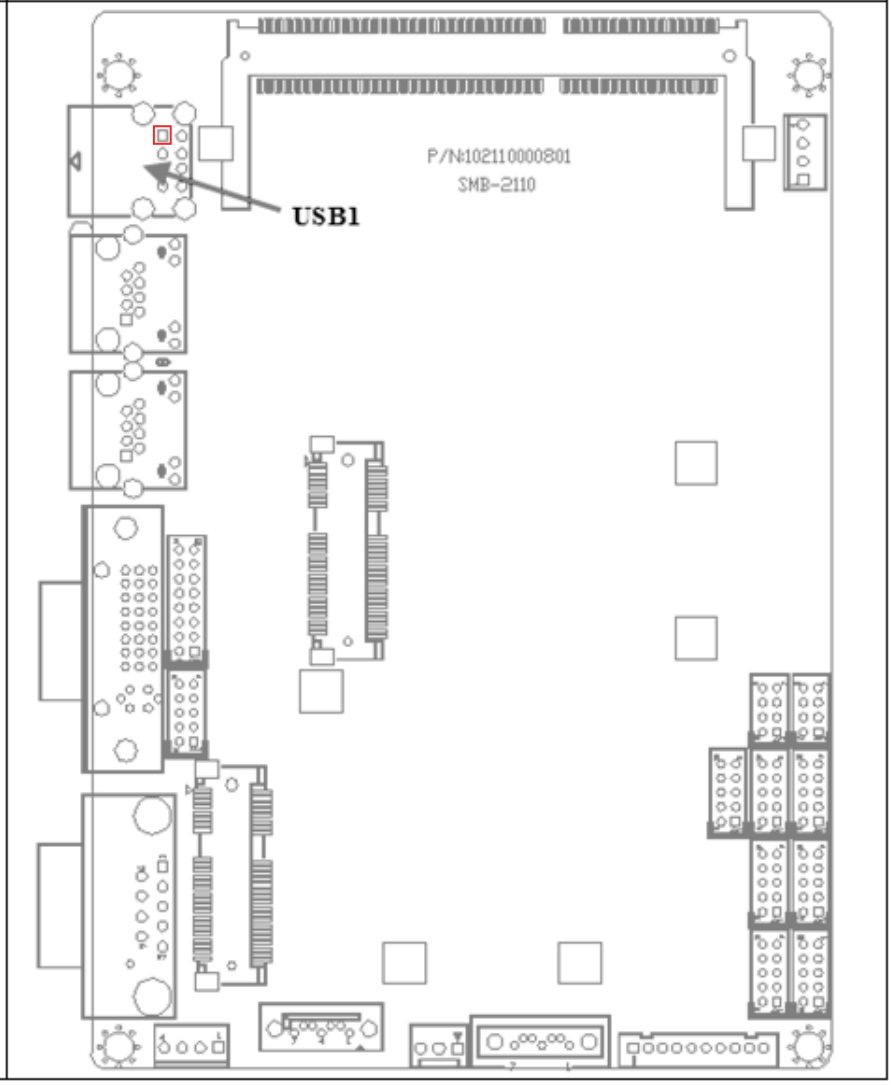
<tr><td>Connector map</td><td> 
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<tr><th colspan="2">LAN connector</th></tr>
<tr><td>Connector size</td><td>12 Pin</td></tr>
<tr><td>Connector type</td><td>RJ45+LED</td></tr>
<tr><td>Connector location</td><td>LAN1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>LAN0_MDI0P</td><td>2</td><td>LAN0_MDI0N</td></tr>
<tr><td>3</td><td>LAN0_MDI1P</td><td>4</td><td>LAN0_MDI2P</td></tr>
<tr><td>5</td><td>LAN0_MDI2N</td><td>6</td><td>LAN0_MDI1N</td></tr>
<tr><td>7</td><td>LAN0_MDI3P</td><td>8</td><td>LAN0_MDI3N</td></tr>
<tr><td>9</td><td>LAN0_ACT#</td><td>10</td><td>LAN0_ACTPW</td></tr>
<tr><td>11</td><td>LAN0_LINK#</td><td>12</td><td>LAN0_LINKPW</td></tr>
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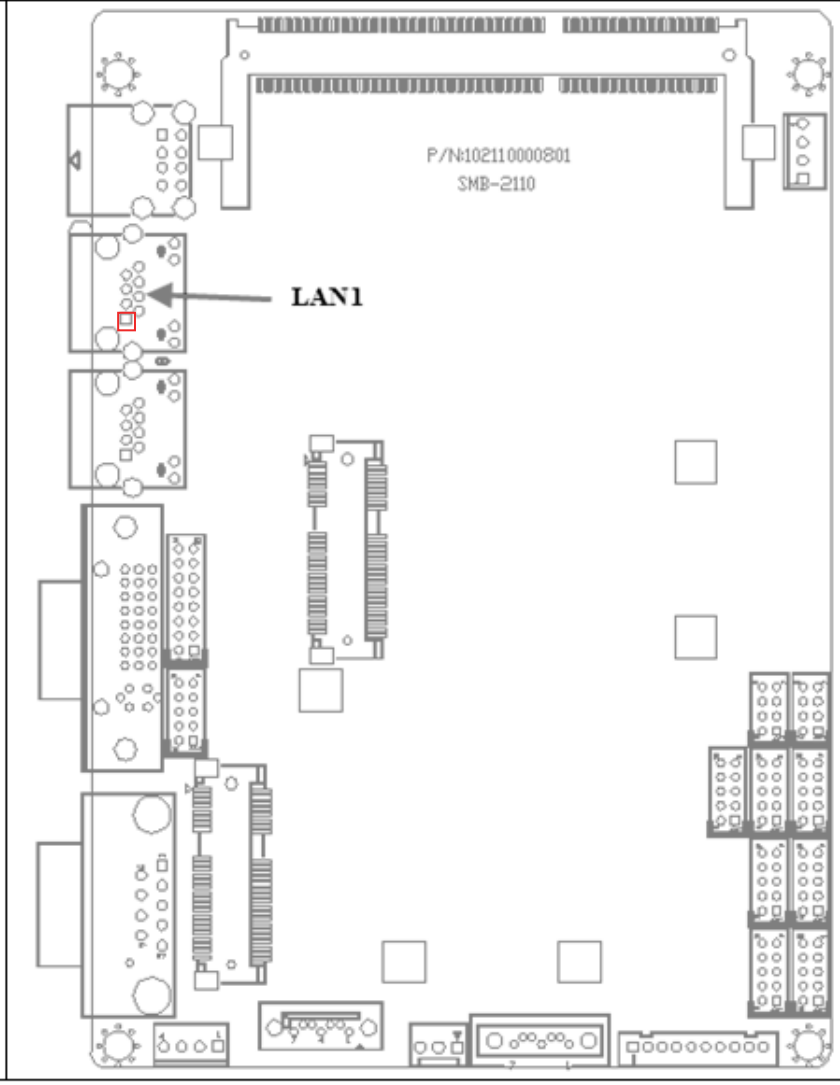
<tr><td>Connector map</td><td> 
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<table>
<tr><th colspan="2">LAN connector</th></tr>
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<tr><td>Connector type</td><td>RJ45+LED</td></tr>
<tr><td>Connector location</td><td>LAN2</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
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<tr><td>3</td><td>LAN1_MDI1P</td><td>4</td><td>LAN1_MDI2P</td></tr>
<tr><td>5</td><td>LAN1_MDI2N</td><td>6</td><td>LAN1_MDI1N</td></tr>
<tr><td>7</td><td>LAN1_MDI3P</td><td>8</td><td>LAN1_MDI3N</td></tr>
<tr><td>9</td><td>LAN1_ACT#</td><td>10</td><td>LAN1_ACTPW</td></tr>
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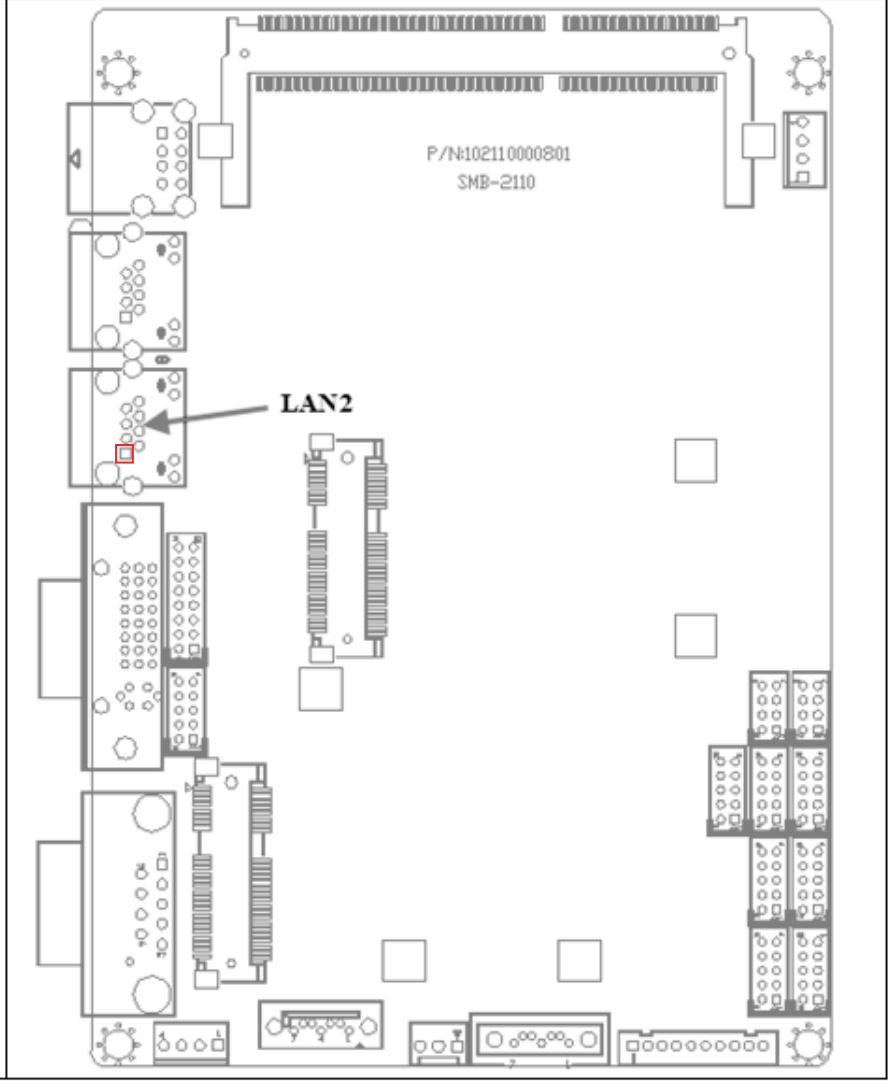
<tr><td>Connector map</td><td> 
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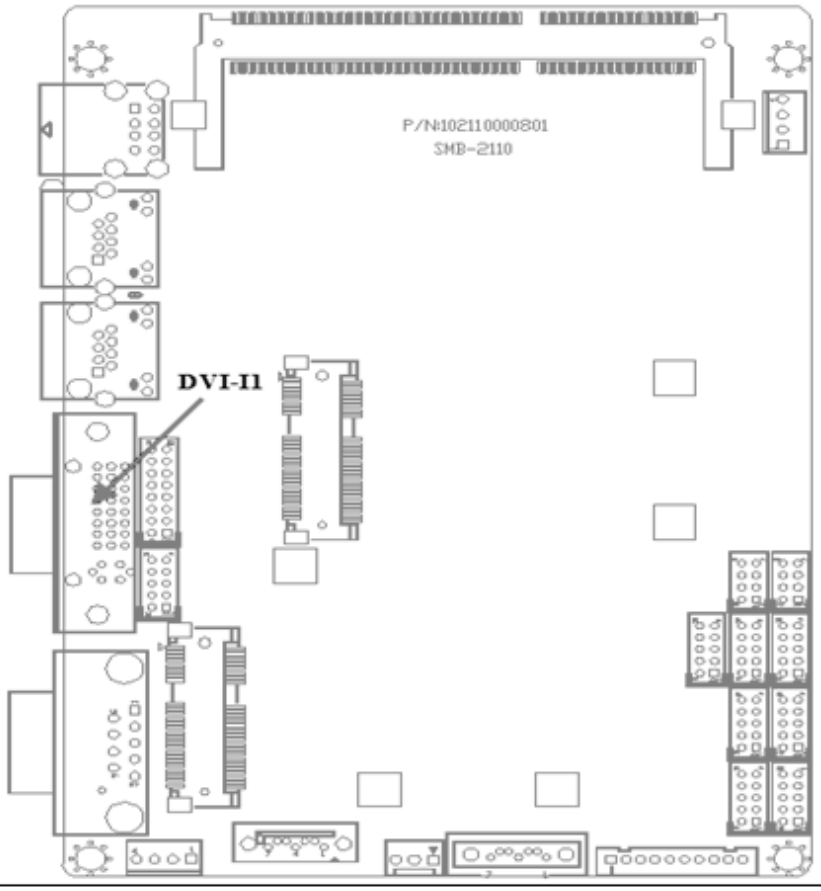
DVI-I connector	
Connector size	50 Pin
Connector type	DVI-I
Connector location	**DVI-I1**
Connector map	

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<tr><td>Connector location</td><td>COM1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th colspan="3">Signal</th></tr>
<tr><td></td><td>RS232</td><td>RS422</td><td>RS485</td></tr>
<tr><td>1</td><td>COM1_DCD</td><td>TXD-</td><td>TXD-/RXD-</td></tr>
<tr><td>2</td><td>COM1_RXD</td><td>TXD+</td><td>TXD+/RXD+</td></tr>
<tr><td>3</td><td>COM1_TXD</td><td>RXD+</td><td>NC</td></tr>
<tr><td>4</td><td>COM1_DTR</td><td>RXD-</td><td>NC</td></tr>
<tr><td>5</td><td>GND</td><td>GND</td><td>GND</td></tr>
<tr><td>6</td><td>COM1_DSR</td><td>NC</td><td>NC</td></tr>
<tr><td>7</td><td>COM1_RTS</td><td>NC</td><td>NC</td></tr>
<tr><td>8</td><td>COM1_CTS</td><td>NC</td><td>NC</td></tr>
<tr><td>9</td><td>COM1_RI</td><td>NC</td><td>NC</td></tr>
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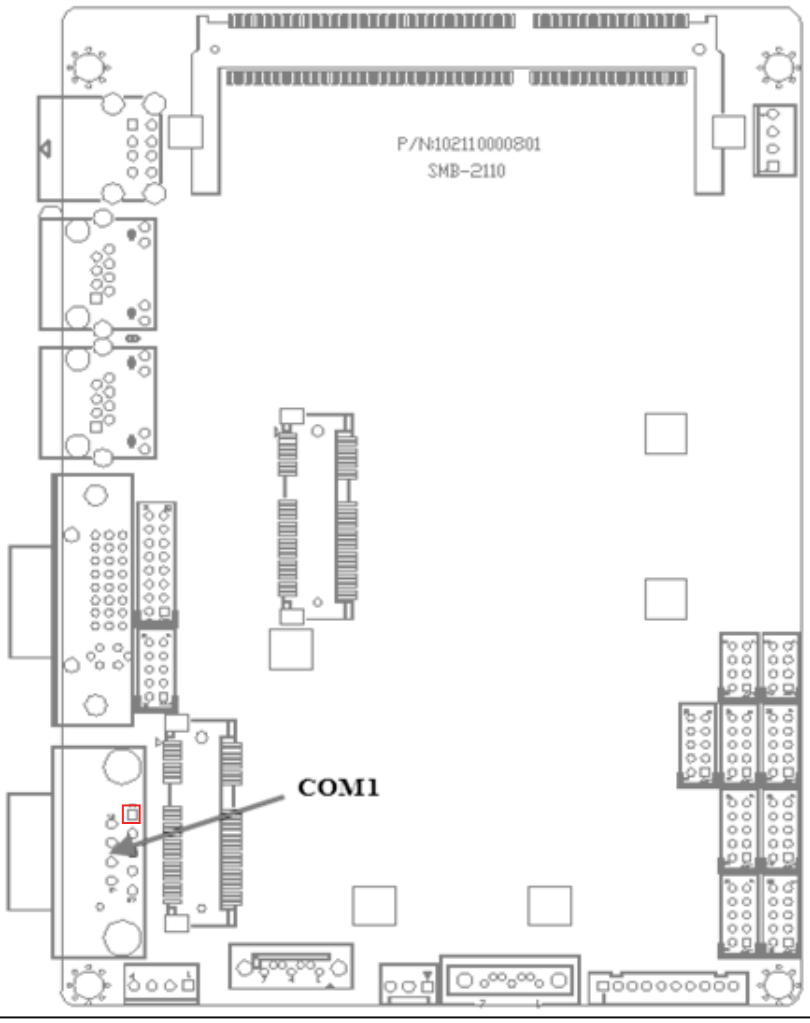
<tr><td>Connector map</td><td> 
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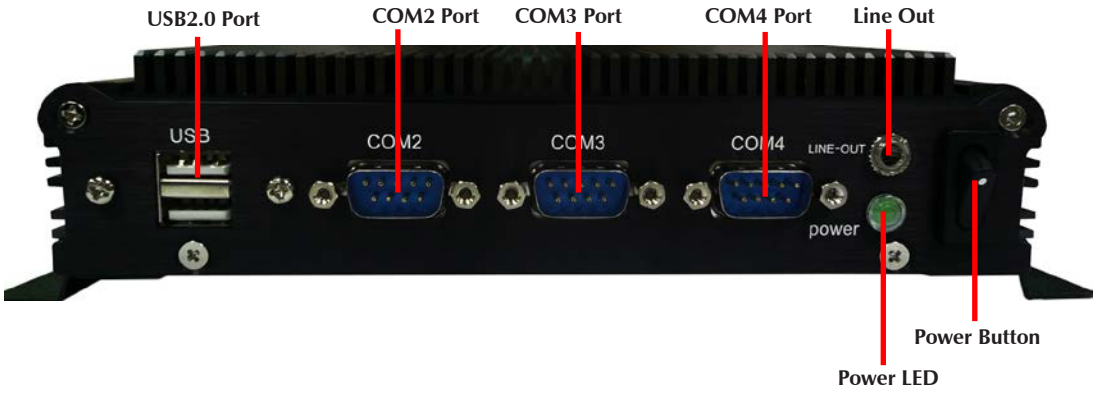
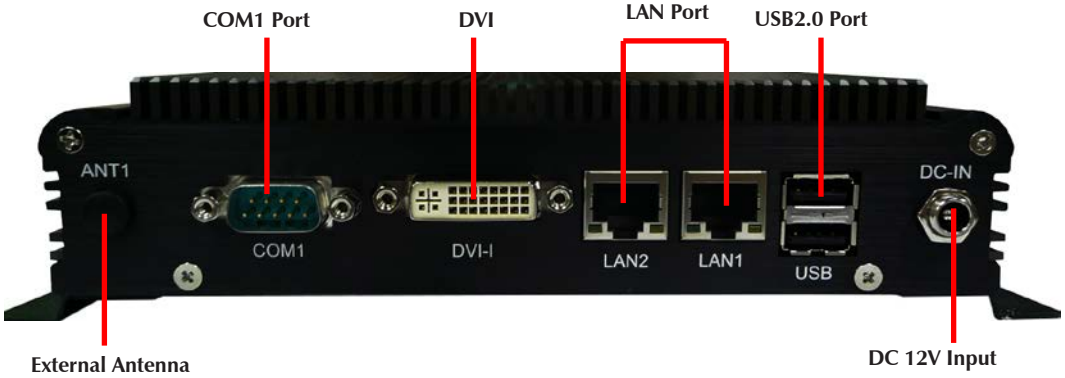
2 System Installation

■ 2.1 System Introduction





■ 2.2 Opening Chassis

Step 1. Unscrew the four screws of the Mounting Bracket as shown in the picture.

Step 2. Unscrew the four screws of the Back Cover and the four screws of Rear/Front Panel as shown in the picture.

Step 3. Open the Back Cover as shown in the picture.

■ 2.3 Installing Memory

Step 1. Put Memory on this place as shown in the picture.

Step 2. Hold the Memory with its notch aligned with the Memory socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

Step 3. Fully insert the module into the socket until a “click” is heard as shown in the picture.

Step 4. Press down on the Memory so that the tabs of the socket lock on both sides of the module as shown in the picture.

■ 2.4 Installing HDD / SSD

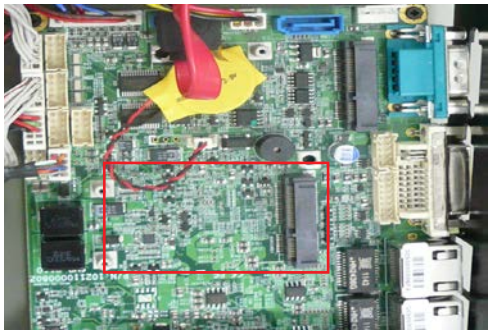
Step 1. Put the HDD/SSD on the Back Cover as shown in the picture.

Step 2. Turn over the Back Cover and screw the four screws of the Back Cover as shown in the picture.

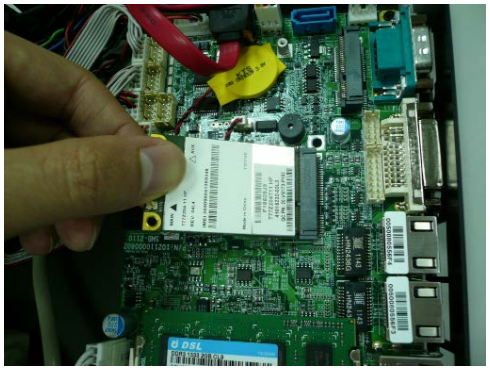
Step 3. Connect the HDD/SSD power cable and SATA cable to HDD /SSD as shown in the picture.

■ 2.5 Installing MINI PCI Express Expansion Card

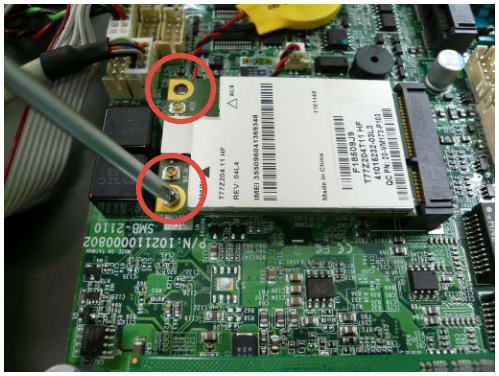
Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



Step 3. Screw two screws to the holder as shown in the picture.



Step 4. Done as shown in the picture.

■ 2.6 Installing MINI PCI Express Expansion Card

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.

Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.

Step 3. Screw one screw to the holder as shown in the picture.

Step 4. Done as shown in the picture.

3 BIOS

■ 3.1 Entering The BIOS

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

Press DEL to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system by turning it OFF and On or pressing the RESET button. You may also restart the system by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

SBOX-2150 Mainboard V1.0 073109 where :

1st digit refers to BIOS maker as A = AMI, W = AWARD, and P = PHOENIX

2nd - 5th digit refers to the model number.

6th digit refers to the chipset as I = Intel, N = NVIDIA, A = AMD and V = VIA.

7th - 8th digit refers to the customer as MS = all standard customers.

V1.0 refers to the BIOS was released.

073109 refers to the date this BIOS was released.

Control Keys

Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press (DEL) key to enter Setup.

<↑>	Move to the previous item
<↓>	Move to the next item
<←>	Move to the item in the left hand
<→>	Move to the item in the right hand
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F3>	Load Optimized Defaults
<F4>	Save all the CMOS changes and exit

Getting Help

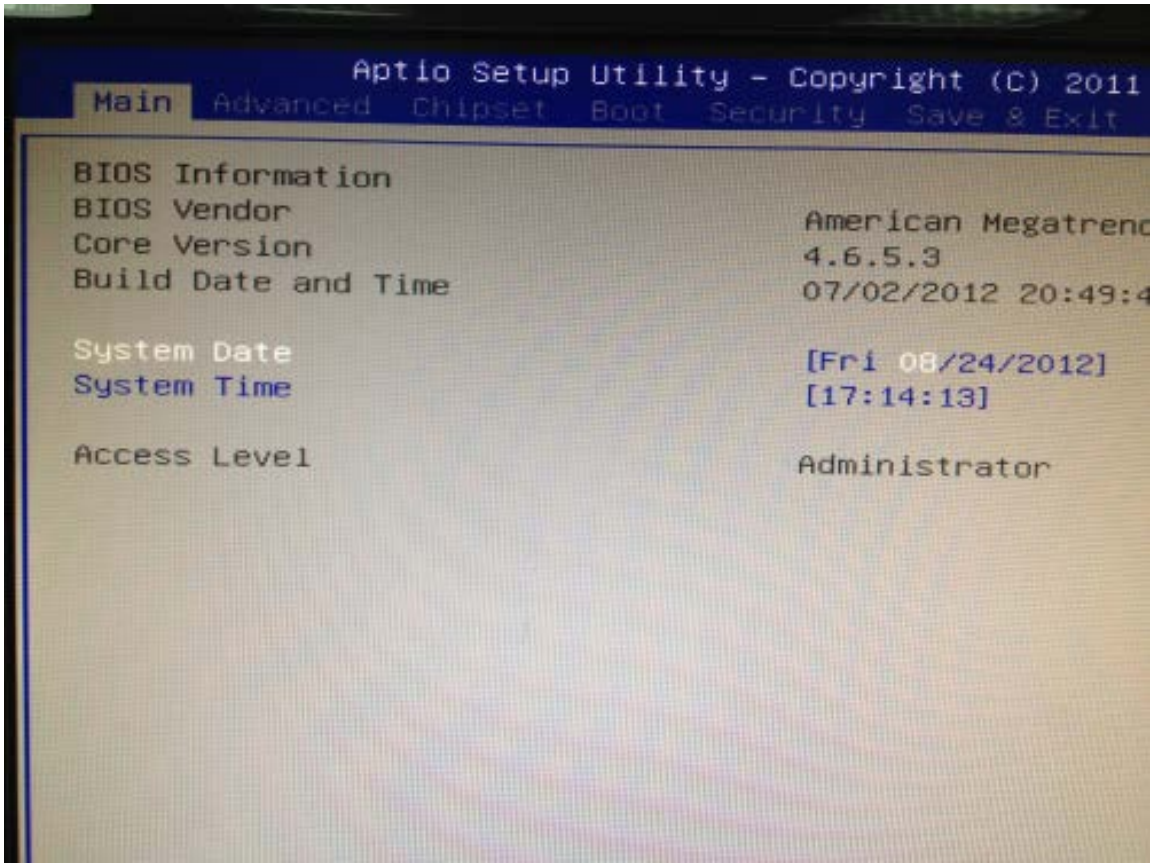
After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu
The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The on-line description of the highlighted setup function is displayed at the bottom of the screen.

Sub-Menu
If you find a right pointer symbol (as shown in the right view) appears to the left of certain fields that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, just press the <Esc >.

General Help <F1>
The BIOS setup program provides a General Help screen. You can call up this screen from any menu by simply pressing <F1>. The Help screen lists the appropriate keys to use and the possible selections for the highlighted item. Press <Esc> to exit the Help screen.

■ 3.2 Main



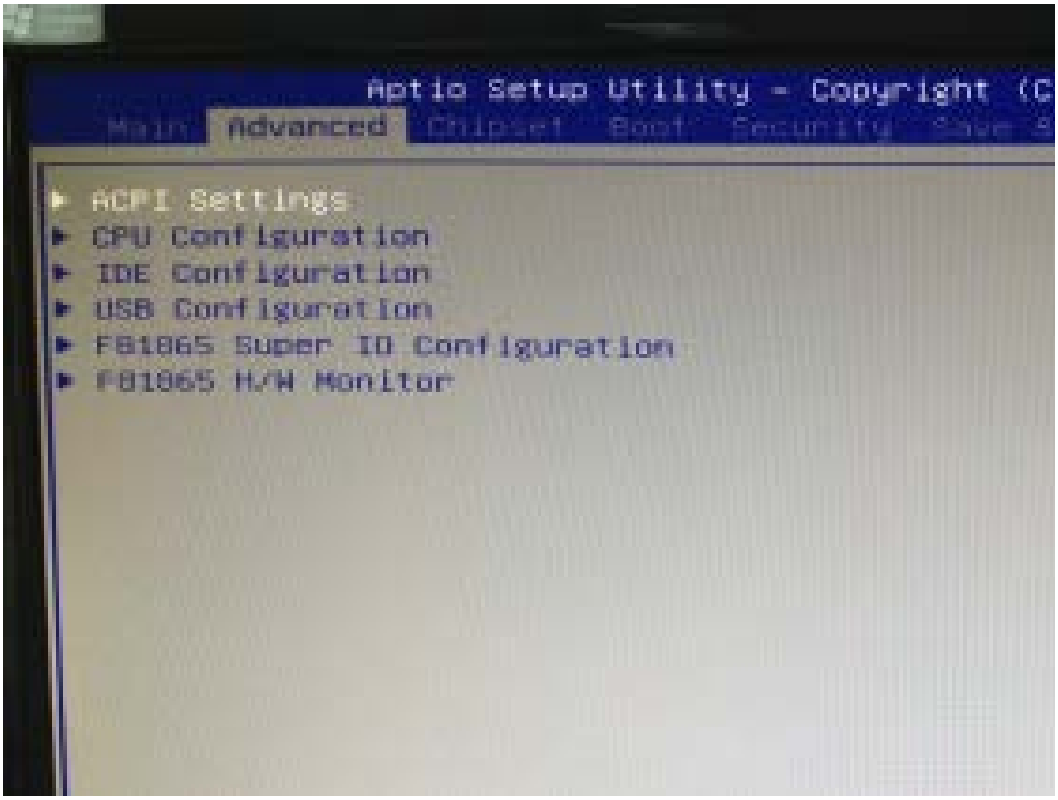
System Time

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

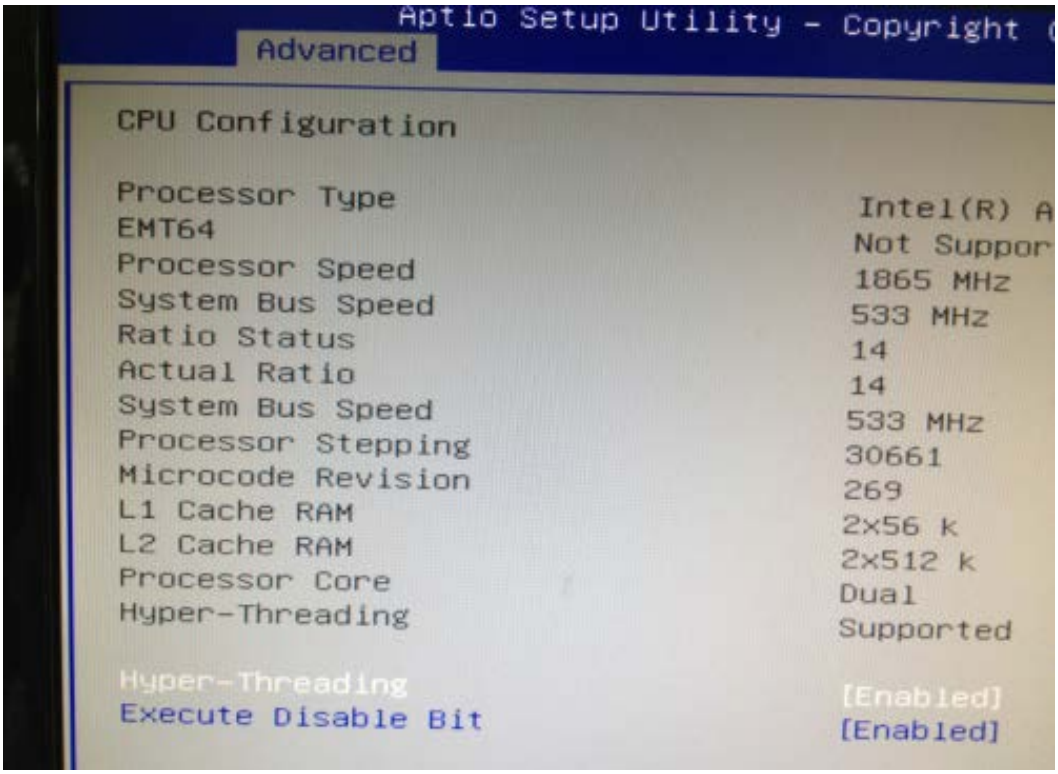
System Date

This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

■ 3.3 Advanced



☞ CPU Configuration



» Max CPUID Value Limit

The Max CPUID Value Limit BIOS feature allows you to circumvent problems with older operating systems that do not support the Intel Pentium 4 processor with Hyper-Threading Technology. When enabled, the processor will limit the maximum CPUID input value to 03h when queried, even if the processor supports a higher CPUID input value. When disabled, the processor will return the actual maximum CPUID input value of the processor when queried.

» Execute Disable Bit Capability

Intel's Execute Disable Bit functionality can prevent certain classes of malicious "buffer overflow" attacks when combined with a supporting operating system. This functionality allows the processor to classify areas in memory by where application code can execute and where it cannot. When a malicious worm attempts to insert code in the buffer, the processor disables code execution, preventing damage or worm propagation.

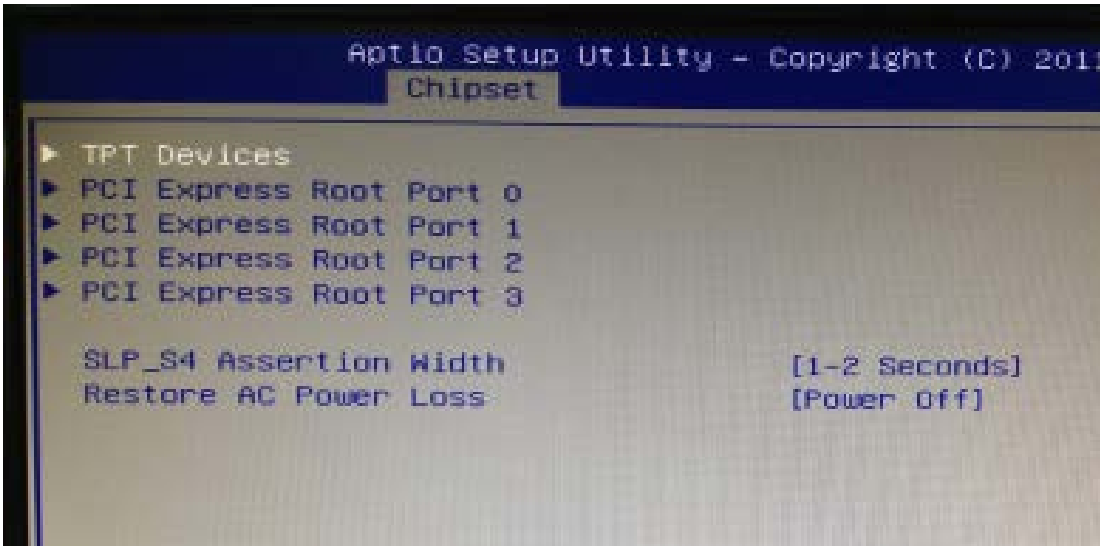
» Hyper Threading Technology

The processor uses Hyper Threading technology to increase transaction rates and reduces end-user response times. The technology treats the two cores inside the processor as two logical processors that can execute instructions simultaneously. In this way, the system performance is highly improved. If you disable the function, the processor will use only one core to execute the instructions. Please disable this item if your operating system doesn't support HT Function, or unreliability and instability may occur.

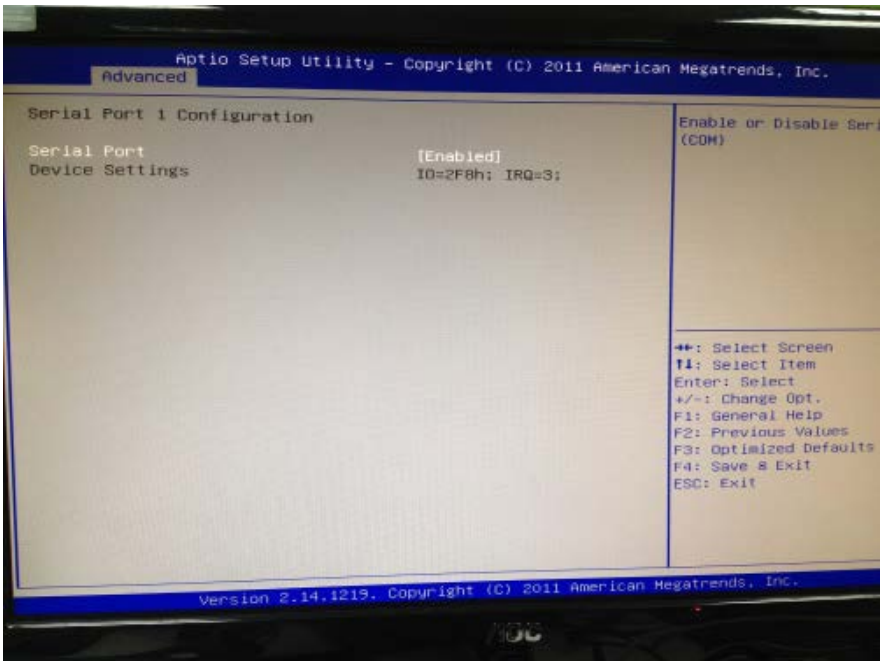
» Intel(R) SpeedStep(tm) Tech

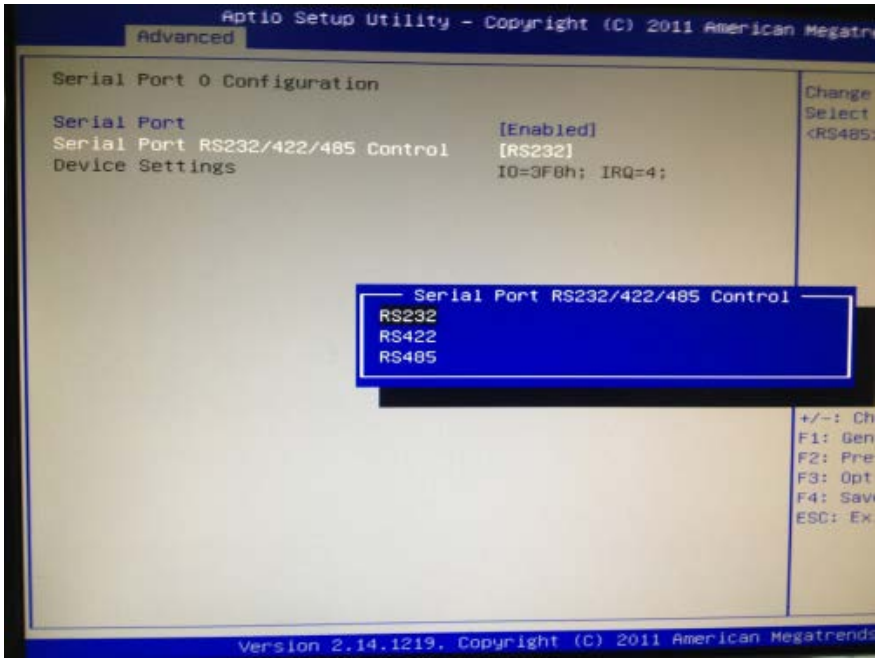
EIST (Enhanced Intel SpeedStep Technology) allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production..

☞ PCI/ PCIE Device Configuration



☞ Super IO Configuration





» Serial Port 0/1/2/3/4/5 Enable or Disable

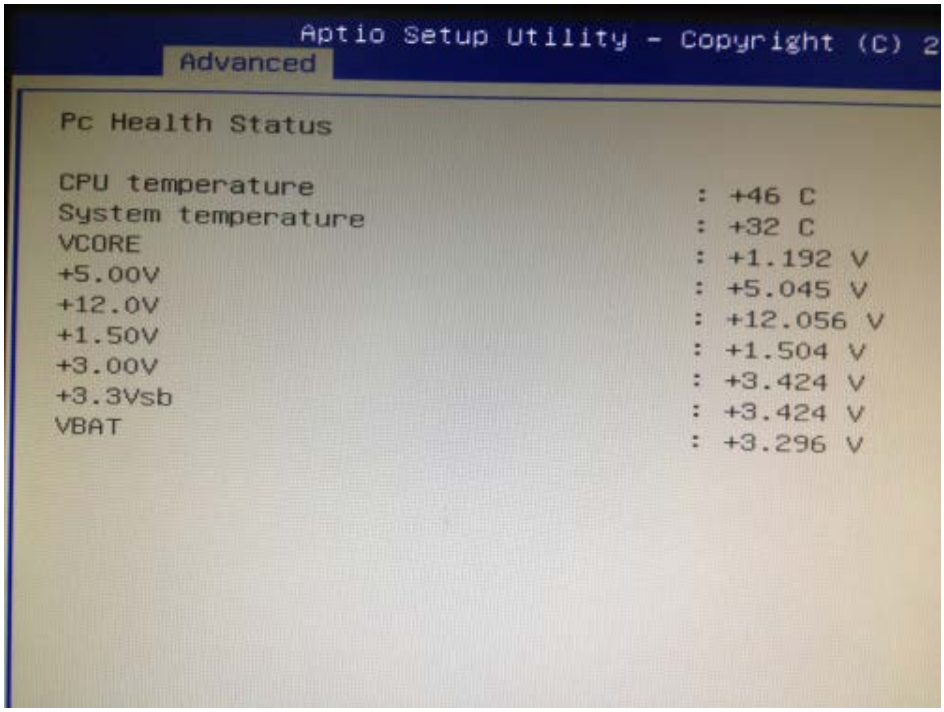
Select an Enable or Disable for the specified serial ports.

» Serial Port 0 Mode

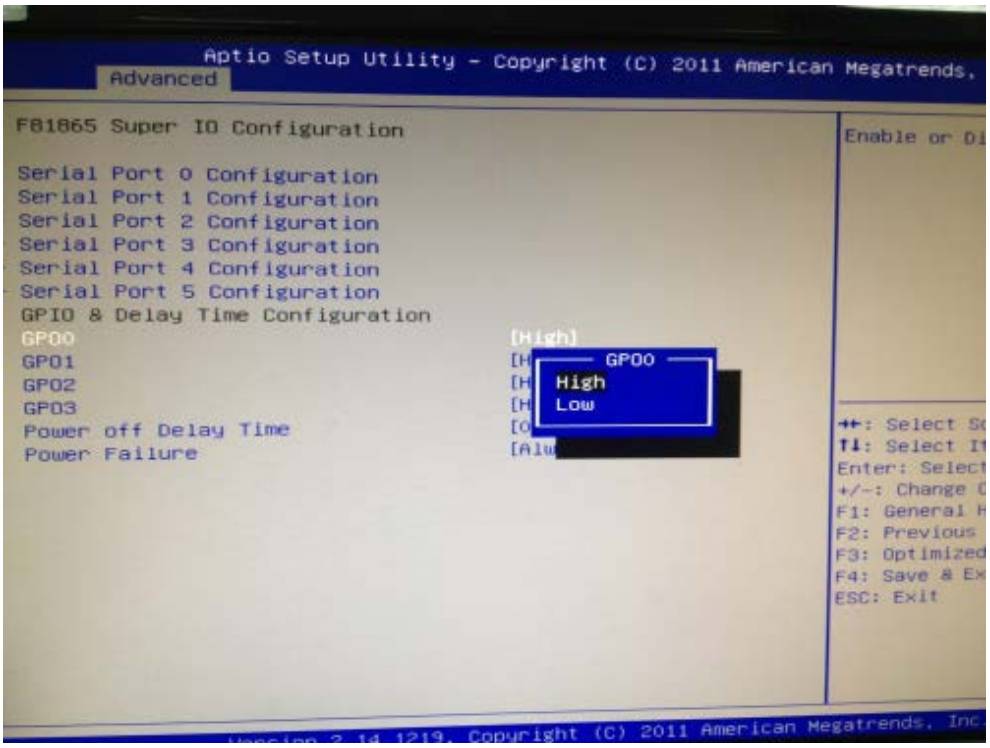
The settings specify the RS-232/RS-422/RS-485 mode of the serial prot 0.

☞ Hardware Health Configuration

These items display the current status of all monitored hardware devices/components such as voltages, temperatures and all fans' speeds.


Aptio Setup Utility – Copyright (C) 2
Advanced
Pc Health Status
CPU temperature : +46 C
System temperature : +32 C
VCORE : +1.192 V
+5.00V : +5.045 V
+12.0V : +12.056 V
+1.50V : +1.504 V
+3.00V : +3.424 V
+3.3Vsb : +3.424 V
VBAT : +3.296 V

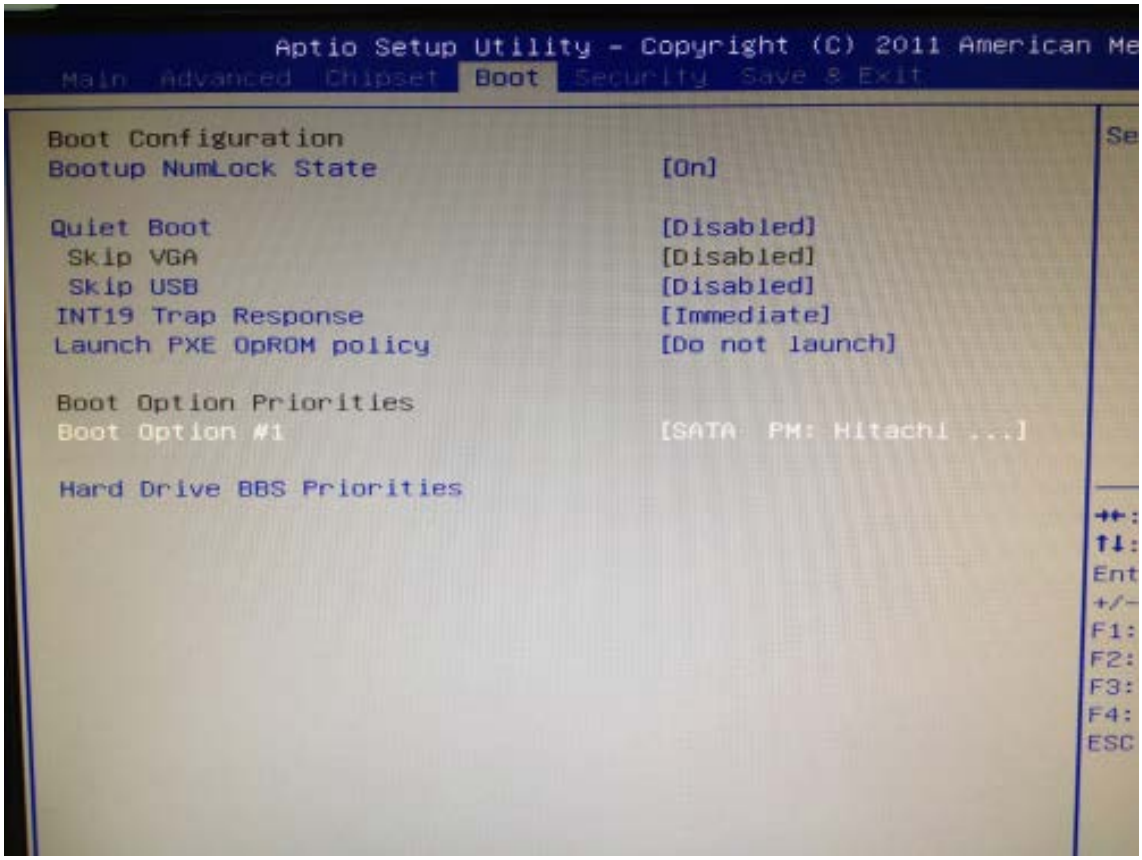
☞ GPIO Configuration



» **GPO 0/ 1/ 2/ 3/ Data**

These settings configure special GPIO data.

■ 3.4 Boot



» **1st/2nd/3rd Boot Device**

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

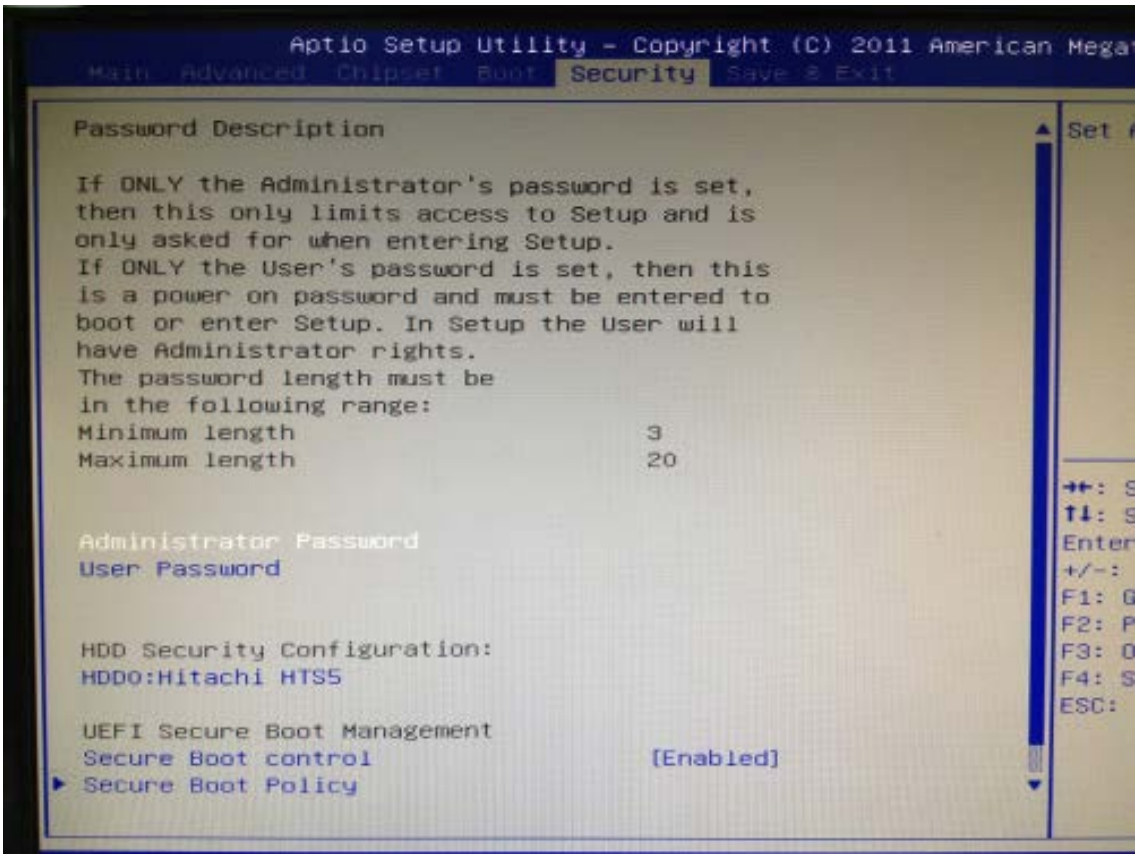
» **Try Other Boot Devices**

Setting the option to [Enabled] allows the system to try to boot from other device if the system fail to boot from the 1st/2nd/3rd boot device.

» **Hard Disk Drives, CD/DVD Drives, USB Drives**

These settings allow you to set the boot sequence of the specified devices.

■ 3.5 Security


Aptio Setup Utility – Copyright (C) 2011 American Mega
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
HDD Security Configuration:
HDD0:Hitachi HTS5
UEFI Secure Boot Management
Secure Boot control [Enabled]
Secure Boot Policy
Set
Enter
F1:
F2:
F3:
F4:
ESC:

» **Administrator Password**

Administrator Password controls access to the BIOS Setup utility. These settings allow you to set or change the administrator password.

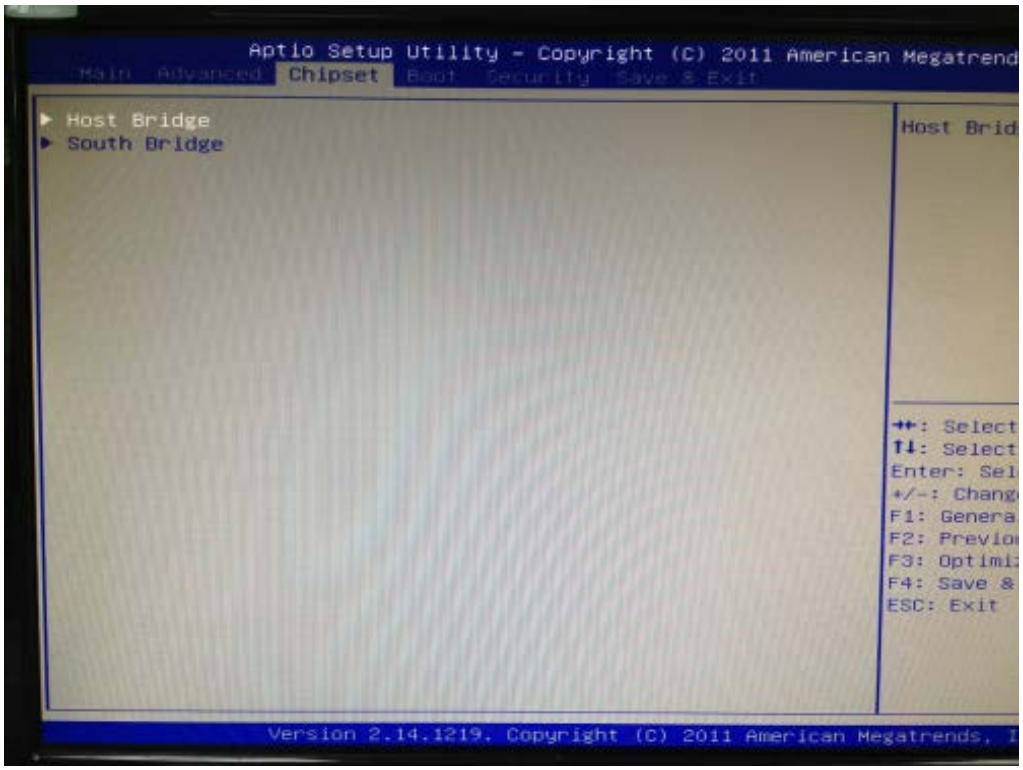
» **User Password**

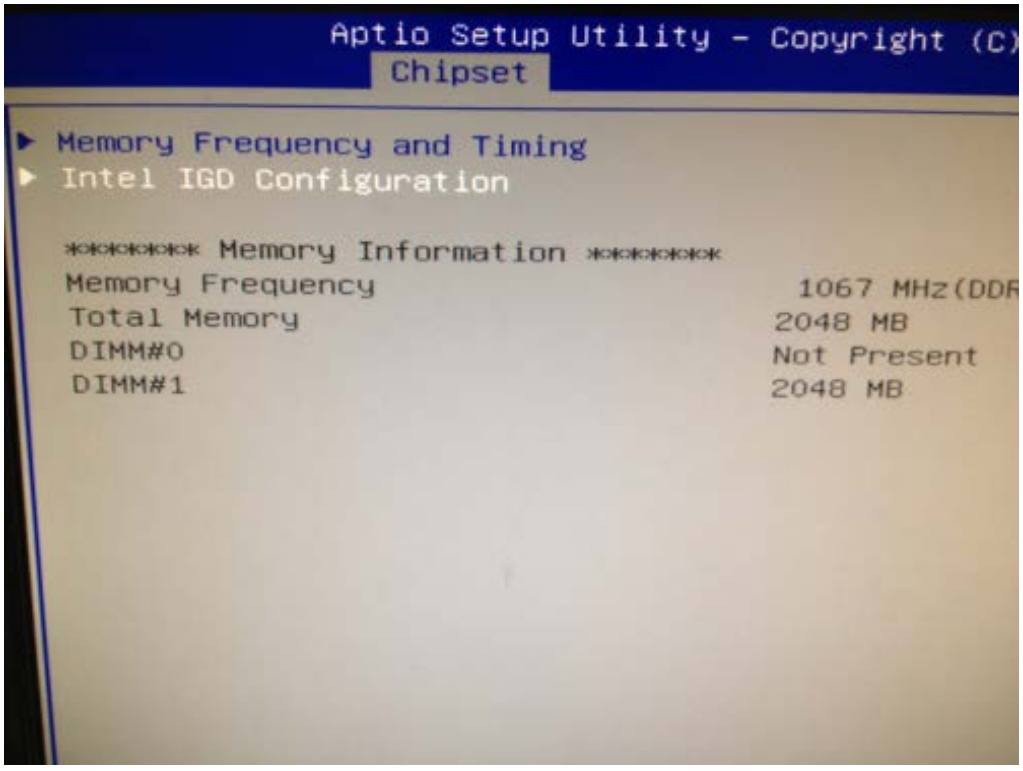
User Password controls access to the system at boot. These settings allow you to set or change the user password.

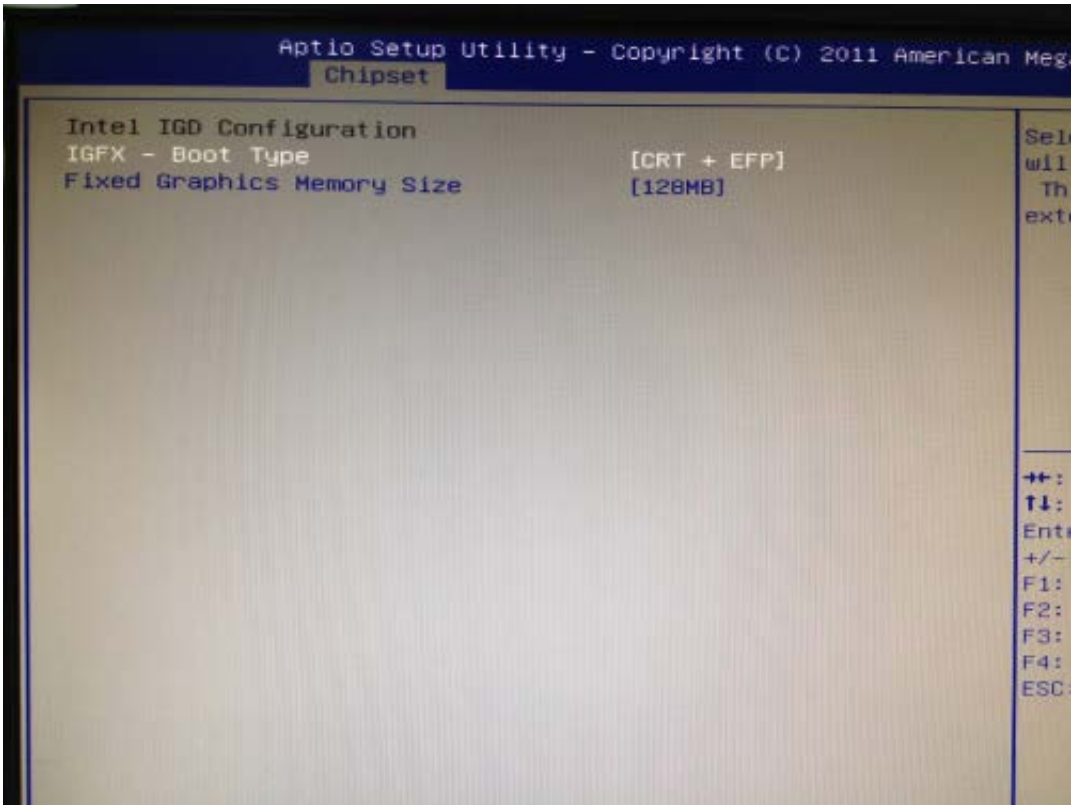
» **Boot Sector Virus Protection**

This function protects the BIOS from accidental corruption by unauthorized users or computer viruses. When enabled, the BIOS data cannot be changed when attempting to update the BIOS with a Flash utility. To successfully update the BIOS, you will need to disable this Flash Protection function.

■ 3.6 Chipset

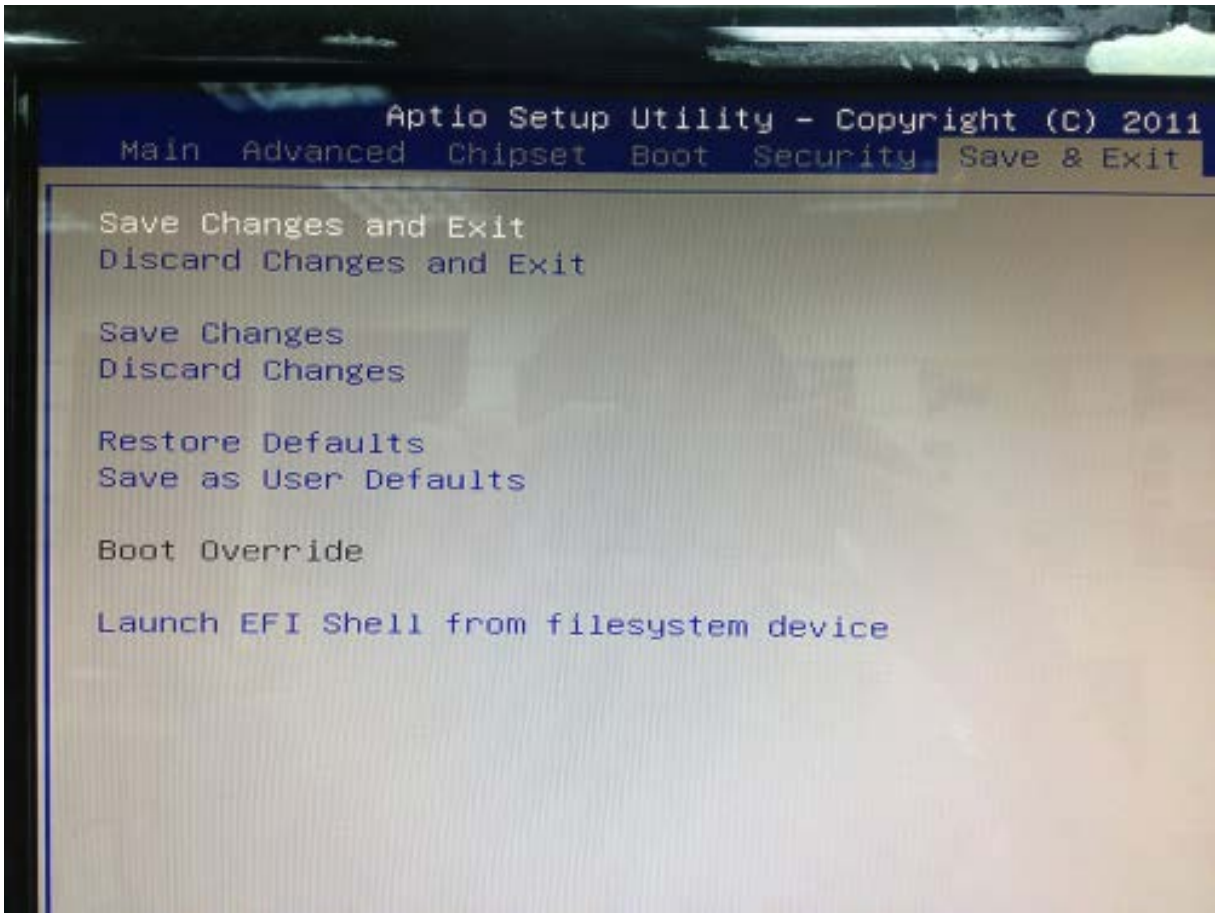

Aptio Setup Utility – Copyright (C) 2011 American Megatrend
Main Advanced Chipset Boot Security Save & Exit
Host Bridge
South Bridge
Host Brid
→←: Select
↑↓: Select
Enter: Sel
+/-: Chang
F1: Genera
F2: Previo
F3: Optimi
F4: Save &
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, I


Aptio Setup Utility – Copyright (C)
Chipset
Memory Frequency and Timing
Intel IGD Configuration
******* Memory Information *******
Memory Frequency 1067 MHz(DDR
Total Memory 2048 MB
DIMM#0 Not Present
DIMM#1 2048 MB



» **Select Graphic Output Mode**

■ 3.7 Exit


Aptio Setup Utility – Copyright (C) 2011
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Boot Override
Launch EFI Shell from filesystem device

» **Save Changes and Exit**

Save changes to CMOS and exit the Setup Utility.

» **Discard Changes and EXit**

Abandon all changes and exit the Setup Utility.

» **Discard Changes**

Abandon all changes and continue with the Setup Utility.

» **Load Optimal Defaults**

Use this menu to load the default values set by the mainboard manufacturer specifically for optimal performance of the mainboard.

» **Load Failsafe Defaults**

Use this menu to load the default values set by the BIOS vendor for stable system performance.

4 Packing List

■ 4.1 Packing List

Part Number	Module Name
762120011000	SBOX-2150
370821201000	SBOX-2150 Mount Bracket
548201206001	Power Adapter 12V/5A 60W Jack
Option	
514001105200	Memory 1GB SO-DIMM DDR3 1333
514002105200	Memory 2GB SO-DIMM DDR3 1333
514004105200	Memory 4GB SO-DIMM DDR3 1333
521340012200	HDD WD 160GB SATA HDD/5400/8MB/12ms, 9.5mm
521370012200	HDD WD 320GB SATA HDD/5400/8MB/12ms, 9.5mm
522130012030	2.5" SSD 8GB SSD (SLC Type)
523310010900	2.5" SSD 32GB D2ST2-32GJ30AC1QN (MLC Type)
523400002000	2.5” SSD 40GB SSD (MLC Type) X25V
523410002000	2.5” SSD 80GB SSD (MLC Type)
523340002000	2.5” SSD 160GB SSD (MLC Type)
534002150400	SATA DOM 2GB SATA DOM(SLC Type)
534004150400	SATA DOM 4GB SATA DOM(SLC Type)
534008150400	SATA DOM 8GB SATA DOM(SLC Type)
573000011093	3G / GPS HSPA/UMTS –800/850/900/1900/2100MHz Quad-band EDGE/GPRS/GSM –850/900/1800/1900MHz Single-band CDMA –1900MHz GPS is Standalone, gpsOne XTRA assistance for enhanced standalone GPS performance, MS-based assisted (support varies based on network carrier)
342221832010	Power Cord (EU Type)
342221832000	Power Cord (US Type)
570802090040	WiFi /BT Ralink(RT3090BC4) 1X1 802.11n, Wireless Lan and CSR Bluecore4 Bluetooth2.1+EDR (Microsoft in-box driver, profiles;Motorola profiles) / software upgradable to BT3.0+HS(Motorola) Combo Mini card
570802010062	WiFi QCOM Ralink 802.11b/g/N, 2T2R Mini PCIe
972009720000	Microsoft Windows Embedded Standard 2009 (Windows XP Embedded)
970022730000	Microsoft Windows® 7 Professional for Embedded Systems